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GAS JOURNAL

LIGHT * HEAT * POWER * BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

VOL. CXLVIII. No. 2945.] LONDON, OCT. 21, 1919. [71ST YEAR. PRICE 8d.

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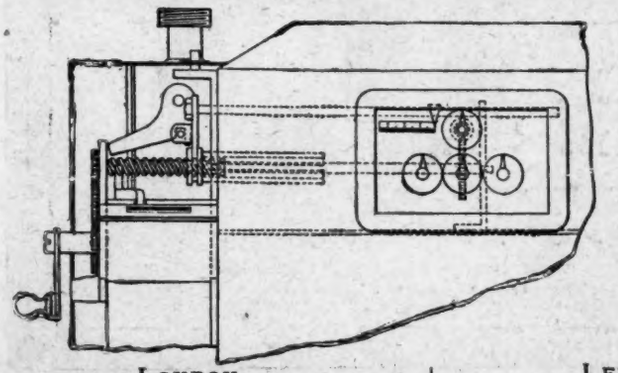

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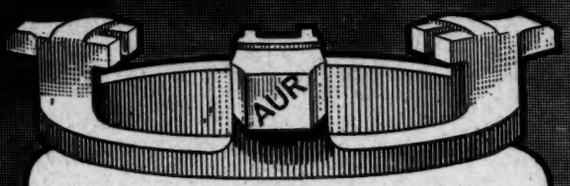

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EDITOR & PUBLISHER: WALTER KING. OFFICE: 11, BOLT COURT, FLEET ST., LONDON, E.C. 4.

VOL. CXLVIII., No. 2945.] TUESDAY, OCTOBER 21, 1919. [71ST YEAR.

EDITORIAL NOTES.

The Reunion in Paris.

THE great event of the past week has been the visit of allied gas engineers to Paris and the Marne and Somme battlefields, on the invitation of the President and members of the Société de l'Industrie du Gaz en France. Only the British and Belgian gas engineers were able to accept the invitation; and there was universal regret among members of the French Société and the British and Belgian visitors that representatives could not be there from America owing to distance, and from Italy owing to the internal difficulties of the country. The weather was kind throughout the five days' journeyings, with the exception of a little rain on Thursday afternoon; and fine geniality between the men whose nations had been united in a great cause coursed uninterruptedly through the days that simply winged their way. We have been, and we have seen the great sufferings and deep scars of noble France, inflicted by the hatred, the viciousness, and the low morale of the former Prussian governors of Germany, and through their hordes of willing instruments. While we were glad and happy before to have fought shoulder to shoulder with our French Allies, now that we have traversed two of the devastated war sectors, the happiness is intensified that we were joined with France and the other nations in conquering a brutal force operated by the grossest inhumanity. We publish this week a sketch account of what was seen and done by the travellers; and we have in preparation a report of the principal speeches at the banquet—those delivered by M. Francis Rouland, who presided at the Victory Congress of the Société in July (M. Laurain being now the President), Mr. Thomas Goulden, the Senior Vice-President of the Institution of Gas Engineers (acting for Sir Dugald Clerk, who, unfortunately, could not be present), and M. de Gand, the President of the Belgian Society. The speeches, in language and substance, were of a high order; and that of the erudite M. Rouland rose to a lofty degree of eloquence. We have experienced many times the charm of manner of our French hosts in doing things; and this time the experience was accentuated. One thing that Germany has successfully accomplished has been to reinforce a great friendship between the allied nations; and this was strikingly felt during the week. Congratulations upon the great victory were reciprocal; and the sympathy of the visitors rose day by day as new scenes of cruelty, which sacrificed everything living or material that came in its way, opened up to our eyes. We are glad to have seen and to have realized things of which there was but imperfect knowledge through the written words of the newspapers. The memory of it all will endure.

Looking Backward and Forward.

To say that a Presidential Address is "refreshing and "breezy" may be the truth; but the expression is well worn by use and age. Nevertheless, were the description applied to the deliverance of Mr. Harold E. Bloor, as President, to the North of England Association last Saturday, it would be true; and what is more the substance is the fruit of deep and earnest thought, though there may be some disagreement with the results in some particulars. These are days that teem with topic upon which to concentrate, with the view of constructing our paths for the future; and this is work that must be done if we are not to be left behind. There is no place for the man who thinks that, in considering the future, we have merely to transfer ourselves back to pre-war conditions, and construct on what then existed. The past five years have simply wiped-out the then position; and the elements of a new one have now been brought into being. It is with them that we have to work and build. All this is well recognized in the gas industry; but there are some without ambition who find contentment in a retrospect which illustrates the excellent progress of the industry, despite competition strenuously waged. Mr. Bloor is not one of these. He indulges in a little retrospect to show our industrial health and vitality. But he does not do this with any view of testifying contentment; for all the statistical retrospect he is able to offer is of pre-war making. And in the data are the constituents which show they have no indicative value for the present or the future. Capital expenditure will in the coming years have a new relation to gas made or sold. A make of gas per ton of coal handled of between 11,000 and 12,000 c.ft. will be looked upon as antiquated. But pre-war progress in patronage and demand is encouraging for the future. In examining this progress, averages, though illustrative, are not reliable, seeing that they cover both good and bad, and conditions of great diversity, including magnitude and opportunity. But if we take the President's figures, and indulge in a little arithmetical exercise, it is found that the average capital per undertaking of the statutory concerns in 1882 was £100,522; in 1913, £168,143. The average make of gas increased from 145,166,686 c.ft. in 1882 to 242,133,642 c.ft. in 1913. An increase from close upon 2 million consumers to over 7 millions in the same period is rich progress, though largely accounted for by the inflow of prepayment consumers, which has been the cause of reducing the average consumption per consumer to the considerable degree shown in the address. If, however, things work out as the gas industry desires, this average will largely increase. Gas may be expensive to-day compared with the past; but it is not expensive in relation to other commodities and other costs. The relation will be further altered if the Board of Trade succeed in inducing Parliament to consent to the recommendation of the Board of Fuel Research, that the industry should produce and trade on B.Th.U., and not cubic feet of gas. The basis of the industry is deepening and broadening; and the structure of this basis is of a more diverse composition than ever; and the more we can make it so the better.

Hence it is that, combined with other circumstances, the industry must look to the future from an entirely new platform. This change in the place of outlook has been largely produced by external circumstances, among which the labour which produces the supplies the industry requires stands prominent. Economic conditions have been knocked altogether out of shape by the related excessive claims made on behalf of the workers, which have conduced to the increased cost of living. That cost of production and therefore selling prices must ascend with the higher prices of labour, are circumstances the truth of which has not been driven home where it is most required. With war and the shortness of labour and transport, it was inevitable there should be an increase in living costs; but what was inevitable has been supplemented by the excess of demand through the trade unions. This excess is due to the initiative of, and stimulant applied by, a certain section of the labour leaders, whose knowledge of the working of economic laws (if they condescend to pay any attention to them) is scanty and at the best hazy. While blame rests with them, there is more blame attaching to those whose business it should have been to endeavour to neutralize pernicious doctrines sedulously and successfully promulgated—"success-

"fully" because of the absence of counter-work. Mr. Bloor makes a point of this. Others, too, are appreciating it, now that much mischief has been done. At the same time, he pays a deserved tribute to the loyalty and the reasonableness of the workers of the gas industry. It is true that the industry is suffering more from the excesses of labour outside than inside. At the same time, wages in the industry have advanced in startling manner. Liberality to the rank-and-file has always been a characteristic within the industry; and there has never been denial of advances commensurate with the increase in the cost of living. But there have been more than signs of a disposition in some quarters to take pattern by what is going on outside. The very character and service of the industry cannot stand any further strain of this sort; and the workers must be taught that there is a future as well as a present to which they must give heed, if they wish to assist in constructive (not destructive) work.

There is clear statement by the President of the fear that sometimes labour demands are put forward by union officials without any agitation by the members of the unions, and then only afterwards adopted by the men. We believe this is so; and there would be hearty welcome, if workable, of a scheme such as he suggests, of a genuinely secret ballot, taken by disinterested parties, being made compulsory before any demand could be regarded as the basis of a strike. We may take it for granted, however, that the leaders would try to find some method of countering this, and securing their own way. But we are not disposed to think with the President, in reference to the recent national railway strike, that either the leaders or the men believe that they have won a "glorious victory"—in fact, it is as clear as anything can be that the leaders know very well they have not, and, as to the men, Mr. Bloor's suggestion would indicate a belief on his part that unintelligence resides among them to an extraordinary degree, while the fact is the railway men are one of the most intelligent bodies in our industrial system. Though the real point at issue is still unsettled, we are far from subscribing to the submission that "the conclusion is difficult to resist that the course of "the negotiations will prove the position of the State to "have been weakened by the strike." The men went back to work without the point at issue being settled, although their leaders at first stubbornly resisted it. But facts and good counsel were too strong for them. What was done was merely sufficient to enable the leaders to return to the men without empty hands; and what was done events, in our opinion, will prove has (considered quite apart from the losses directly due to the strike) cost the country little.

The section of the address in which statistics are given as to the course during the war of gas prices, dividends, and apparatus hired and sold is instructive, but it all applies to York. Towns, however, vary immensely; and, therefore, so do results. Gas consumers in York are to be congratulated upon the fact that the price of gas is only 3s. 1d. per 1000 c.ft.; but the absurd standard price fixed upon the Company a few years ago—2s. 3d., or over 1s. 6d. below the average standard price for the country—is brought into prominent relief by the fact that even at the 3s. 1d. charge not more than 3 p.ct. dividend can be paid. The number of consuming appliances hired in York greatly exceeds the number sold; but there is agreement with Mr. Bloor that it is a far better proposition to sell apparatus than to hire, where it can be done. But buyers are in the minority, and hirers in the majority; and it is necessary, in each case, to follow the line of policy that is best for the gas business.

If we are to do the best possible in the industry, there will have to be a grand rectification of the mistakes of the past, and altogether new plans for the future. One by one, the lines of rectification and new procedure are being formed, and steps are being taken for their permanent establishment. What has now been found and what has been done, or is being done, hardly goes far enough. We want to put ourselves right internally; but the means of doing so should also be of the right order. Mr. Bloor speaks of Expert Committees being, in these days of technical development, a need in our statutory methods. The electricity industry is going to have its permanent body of Electricity Commissioners, some of whom will be electrical experts. The gas industry will have the Board of Trade through whom to work; but the old parliamentary procedure will still apply to it in connection with the promotion of Special Bills. However desirable Committees of experts may be, there are unfortunately, even in them, the dangers of absence of disinterestedness and of the durability of preconceptions, which seem to be immutable with some men even though change commands. As is only too well known, the reports of Committees issued during the war, containing advice for the Government, are alive with the prepossessions of their framers; and Mr. Bloor points to one such report when he mentions and criticizes some recommendations of the Committee appointed to consider the provision of dwellings for the working classes. His criticism is quite our view; and therefore it need not be supplemented. But there is no question that we do want a better system than we now possess for producing and controlling legislation for an industry with a technical basis, and rendering such large public service, the commercial principles affecting which service are bound-up with its technical efficiency. The old ways of dealing with these matters are obsolete, but are kept alive through (in and about the legislative Chambers) sheer ignorance of, or indifference to, needs. If it were not so, means would long before this have been found at Westminster for placing the industry in a good position for obtaining capital for the production of economy in the public interests, and for giving the owners of the existing capital a fair return. These are matters on which Mr. Bloor spoke well and strongly. There is no pleading for anything which should not be ours as a matter of justice.

There is only one thing over which the President is sceptical; and that is as to the practicability of low grades of gas in present circumstances. But his scepticism seems to be swayed by what he believes to be public opinion—as well as by the existence of plant and appliances designed for gas of 500 B.Th.U. or over. Public opinion and plant must be converted if progress necessitates. Nothing appears to have transpired that suggests to Mr. Bloor economy and practical value in putting per ton of coal used as many B.Th.U. as practicable into the gas-mains. In this one matter, his policy is to "wait and see" the results from other undertakings possessing in this particular matter less meticulous engineers and managers—undertakings supplying lower calorific qualities—to ascertain whether, in their cases, balance-sheets and consumers' bills and satisfaction justify a descent below 500 B.Th.U. However, if we read aright, Mr. Bloor is not an opponent of lower-grade gas; he wants, either from the laboratories or practical experience, more confirmation of expediency. One cannot, of course, tamper with large interests; but the pioneers who have made progress have not been those who have tarried by the wayside, and watched the workers passing by.

A "True" Low-Temperature Process.

All matters associated with coal carbonization invite the interest of the gas engineer. Even if a process has no genuine value for the purposes of gas supply, its working may be educational through being informative as to the limitations of methods, or their influence upon products. The lecture that Mr. R. M'Laurin delivered to the Scottish Junior Association (Eastern District), and a *précis* of which appeared last week, supplies us with a good deal that is of only academic interest. But beyond that it does not carry us. Mr. M'Laurin has struck on a new line of carbonizing investigation, along which we hope he will be able to continue, and in the end find commercial reward, through the realization of an order of products differing in several particulars from those to which we are accustomed from high-temperature carbonization, from semi-high temperature carbonization (such as in verticals with continuous steaming), and from semi-low temperature carbonization like those processes which we have been in the habit of placing in the category of "low-temperature." The descriptive nominal changes given here are of Mr. M'Laurin's creation, because he claims that, apart from scientific investigation, he does not know of any true low-temperature process other than that of which he is the inventor. In this process there is deadly sacrifice of gas, with new products offering compensation, but whether adequate remains to be proved, and the answer (with plant, coal, and labour costing what they do to-day) will no doubt be awaited with some amount of scepticism. But we have the assurance that the process does not threaten our present methods in regard to either gas or coke. The process is so slow that it could never be accepted as a gas-making plant; the make is so low that the capital required for plant would be enormous, and the quantity of coal to be handled could be similarly described. So, as being of possible use to the gas industry, it can at once be dismissed. And while the plant can be worked to

make freely ignitable coke for domestic use, its ordinary operation would be much more likely to attack the coke-oven system, and the field in which metallurgical coke is required.

But the slowness of the process (about which it would be of interest to know more in terms of actual time and quantities) would appear as a deterrent to its general adoption. In the process the coal is carbonized not by external heat, but by the passage to it of hot gases; and this is done in vessels having a diameter of 8 ft. The result is that the coal is carbonized at fairly equal temperatures at the same time all through. A make of not more than 3000 c.ft. of gas per ton of coal, or 2,500,000 B.Th.U., at once puts the system out of court where men are concerned who are looking to upwards of three to four times this thermal value in gas from the coal handled; and between the thermal efficiency of the one system and the other, there is such a deep gulf to be bridged by the differences in the other products that dubiety is very strongly mixed with the interest. We are doubtful, too, as to the character of the gas in respect of inerts, having regard to the method of heating and carbonizing the coal by passing the heating gases directly to it. Not even the extraordinarily good character that is given to the coke in respect of uniformity of hardness and so forth raises any enthusiasm, especially as it tends to leave the domestic field for the metallurgical. The sulphate of ammonia produced does not diverge so very much from gas-works practice with good nitrogen-bearing coals that there is anything in that; and much more as to commercial value will need to be known regarding the dyes that are found in the ammoniacal liquor, and the differences in the constitution of the oils and tars before any definite opinions are formed. The question of costs—capital and running—are not unimportant; but it is not dealt with. It is, however, all very interesting; and we hope Mr. M'Laurin will find success in technical result and monetary reward. No one can say where work of the kind will lead to. It is work of this character that often opens-up new avenues of thought and research, to the ultimate benefit of mankind.

The Re-Examination of Assessments.

The short article by Mr. Arthur Valon in this week's issue, under the title of "An Available Economy," is well worth special attention. In these times, there is a disposition to keep our minds concentrated on the large problems of the gas industry, which are, in truth, absorbing. But we must not permit them to obtain exclusive possession of our minds. Management is not good that allows to slip any economy that can be effected. There was not, generally speaking, so much concern at one time in the industry over small economies as there might have been; but to neglect them is not a course that the industry can afford to follow now. Expenditure has risen so enormously that, although receipts have increased through advanced prices for gas and higher values and better markets for secondary products, the margin between outlay and income has shrunk in a manner that should forcibly appeal to every manager to search out any waste in process, shortage of efficiency, or unnecessary expenditure, and see that it is forthwith brought to account, no matter how small it may be. Compulsory expenditure is, in all conscience, on a scale that should ensure an investigation to see whether there is any which is not compulsory or necessary, and which can be saved without detriment to the undertaking. No one cares to pay out of his own pocket more in rates and taxes than is necessary; and just as this is the case as affecting the individual, so it should be in the case of an undertaking. This is the "available "economy" of which Mr. Valon speaks. He shows in his short article good ground why the old conditions of assessment should not be accepted as applying to the current conditions, which appear likely to have an approximate stability for some time to come. Therefore there are sound reasons for gas undertakings investigating their position in this respect, and ascertaining whether they cannot do as some other undertakings have done—lessen their expenditure on rates by an amount which, if small per 1000 c.ft. in the aggregate, is worth having, and can be utilized to better advantage in the interests of the concern producing the money than by handing it out to others to expend on objects external to the undertaking. Mr. Valon mentions one concern that has saved, by the revision of its assessment in conformity with current conditions, 1¼d. per 1000 c.ft., and another that has saved ¾d. "Not much" some people may say; but 1d. per 1000 c.ft. means £416 per 100 millions. And the £416 may as well be in the gas undertaking's hands to help pay the rates that must be paid, as be unnecessarily paid out as rates claimed upon an assessment which cannot be legitimately sustained under current conditions. Nor does one know to how many years the saving will apply. Every reason urges an examination of assessments in the light of changed circumstances.

Labour Help for the Miners' Federation.

The Government will have to keep their eyes fully open upon the movements of the coal industry nationalization agitators. These gentry are showing a double-sidedness, which cannot escape observation. Before the Government representatives at Downing Street, they did not speak of compulsion. Their words were fragrant with reasonableness and their future course of action in the endeavour to gain their ends was to be by constitutional method. All this is good. But with change of scene from Downing Street to the Albert Hall, and a different audience (last Saturday week), the other side of the same men is seen. There and then industrial pressure was spoken of in order to secure effect being given to the Sankey report; and one speaker more bold than the rest referred to striking as being the only course open to obtain the end of nationalization. So that in a few days the other course—the constitutional one—was lost sight of. There is no question, after what has happened in the railway strike, that the miners' leaders are a little bit timorous as to their ability to alone force the Government into compliance with their will as to nationalization; and their hope and desire are to get the other trade unions on their side. The other trade unions will do well before they ally themselves with this movement to examine circumspectly the object and result, and whether there is any just cause, even so far as the miners themselves are concerned, for a revolution in the ownership and management of the coal industry.

Coal is dear now, and working class people are paying heavily for it in common with other people. Would nationalization cheapen coal? The answer is distinctly "No." Coal is dear for two reasons. The one is that the cost of production (of which some 75 p.ct. now goes to the miners in wages) is heavier than ever it was; and the output is less than before. What chances are there of improvement in these two respects? So far as we can see, they are very slender; and coal could not be cheaper under nationalization than under private ownership. The trade unions whose help is being sought, and the members of which are victims (with the rest of the community) of the operations of the Miners' Federation, must consider their future—the effects on both themselves personally and the industries employing them—when asked to become the tools of those who have made coal nationalization a political move, with the miners playing the game of "follow my "leader" without any genuine personal interest in the issue. The leaders are not making much of the (to the community) most essential point of cheaper coal, because they know it will not stand critical examination; but they are largely basing their appeal on sentiment. At the Albert Hall meeting, there was reference to the tragic circumstances under which the miner pursues his work. Yet the life of the miner is such that son succeeds father in the calling; and there is no dearth of men willing to go to the industry of their own free choice. We know well that underground life has its disadvantages; but the conditions —the money and the hours—have their attractions, more so now than ever. It is sheer twaddle to talk as some of the miners' leaders are doing to gain sympathy for nationalization. It would not alter in the slightest any condition that cannot be changed under private ownership.

To say, too, that certain of the conditions that have ruled during the war, which have not facilitated the maintenance of maximum output, have been due to private ownership is pure nonsense. Private ownership could not help the shortage of wagons, tubs, and other requisites. These conditions were due to the war. Nationalization could not change them. If the Government could have altered them under nationalization, they could have done so under Government control. The other Trade Unions must beware that they are not duped by the miners' leaders. Output is more a question of will on the part of the men than anything else. We turn again to the Albert Hall meeting. A statement of very considerable gravity was then made by

Mr. Frank Hodges, Secretary of the Miners' Federation; and it is one the Government must not ignore. He predicted that the percentage decrease of coal output which has been so serious a feature of the returns during this year would go on at a faster rate in the coming months. That is something over which the country may very well reflect. At the Downing Street conference, the reason given for the reduced output was the letting-down of the machinery under private ownership. At the Albert Hall, with its different atmosphere, there was the truth, which shows that the real reason is of a political nature. There has, however, been another influence at work, which the other trade unions, whose help is required, should note.

We get this plainly put in an article by the Labour Correspondent of the "Daily Telegraph." A few enlightening passages in his article may here be cited. He tells us that greater exertion on the part of the men has been effectively destroyed by the increase of 2s. a day made to the flat-rate war wage. The flat-rate advance to meet the higher cost of living to the lower paid and unskilled workers was right in principle in its inception; but unhappily the principle, once accepted, was carried by successive advances to an extent which quite destroyed the relation between skilled and unskilled work, and made it positively mischievous in its effects on wages and economic conditions. The proper average rate of production was secured by the payment of contract rates to the coal hewer; his daily earnings then depended upon the coal that he produced. Then came the Minimum Wage Act, which secured the coal hewer a certain amount of wages when working in an abnormal place; and the difference which the workman could earn between the fixed minimum and by continuous exertion under his contract rates still gave a stimulus to production. The writer of the article proceeds to point out that, as the minimum was gradually raised, and came nearer to the possible earnings, the stimulus to severe exertion became less. This was the first downward step to a lower production of coal. Successive war wages (on top of the percentage advances) of 1s. 6d., 1s. 6d., and the Sankey 2s.—a total of 5s. per day—brought into existence a new economic factor, which soon affected the production of coal. What follows deserves very serious consideration:

> If we take the minimum wage of coal-getters, apart from their earnings on contract, as ranging from 8s. to 10s. per day, and add to that the war wage of 5s., we get a daily wage ranging from 13s. to 15s., which has got to be paid by the colliery owner to the workman, whatever may be his output of coal. You must always test a matter of this kind by the ordinary law of human nature. If a man is certain of a wage (say) of 14s. a day whatever may be the amount of his output, and it is just possible for him by severe exertion to earn (say) 14s. 6d. or 14s. 9d., is the difference between the fixed minimum and the possible earning sufficient to stimulate him to severe exertion? The collier has got just as much human nature about him as the rest of us; and, to put it at the best, the stimulus to severe exertion has been taken away by the conditions which have been brought into the industry.

The other trade unions whose help is now required by the Miners' Federation to enable the transfer of the control of the mining industry virtually to that body, had better test by living facts the words and prognostications of the miners' leaders. Nothing has been revealed to justify a transfer of the control of the industry to men who have not shown, and are not showing, a very high standard of moral obligation as units in our community. We all want coal; our industries want coal; coal is our very life blood. The miners want high wages and little work. For their indulgence the rest of the country has to pay—the whole of the members of other labour unions among the rest.

Scottish Junior Gas Association (Western District).—The opening meeting of the sixteenth session will be held in the Royal Technical College, Glasgow, next Saturday, when the President, Mr. James Dickson, of Kirkintilloch, will deliver his address. A visit to the Motherwell Gas-Works has been arranged for Nov. 8; and on Nov. 22 a paper will be read by Mr. J. S. M'Nicol, of Dawsholm. Subsequent fixtures are: Dec. 13, visit to Messrs. Baird & Co.'s coke-ovens, Dumbreck. Jan. 24, 1920, paper by Mr. James M'Ghee, of Glasgow. Feb. 7, visit to the Pumpherston Oil Company's works. Feb. 21, paper by Mr. John M'Intyre, of Glasgow. March 6, joint visit with the Eastern District to Messrs. R. & A. Main's works at Falkirk. March 27, annual meeting. Mr. James Cubie, the Hon. Secretary and Treasurer, has forwarded a copy of the Association's "Transactions" for the session 1918-19, reprinted from the "Journal" reports of the meetings.

FUEL RESEARCH BOARD AND GAS STANDARDS.

We have been asked by Sir George Beilby, on behalf of the Fuel Research Board, to give publicity to the following statement.

If the proposed system of charging consumers for thermal units received is to be generally adopted, the establishment of a recording gas calorimeter as the standard instrument is of the first importance. For the consumer, it is essential that he should know, not merely that over any given period he has received on the average gas of the standard calorific value per cubic foot, but that the gas which he is burning hour by hour does not vary by more than a small percentage from that standard. It is being realized more and more by the consumer that constancy in calorific value is of vital importance, if gas is to be burned with economy and efficiency in the apparatus and appliances which he has fitted and adjusted for gas of a standard calorific value.

The primary interests of the consumer are:

(1) That he should only pay for the potential thermal units he receives.
(2) That these potential thermal units should be delivered to him in the form of a gas of constant calorific value.
(3) That the supply should be ample, and should be maintained at a sufficient pressure.
(4) That his appliances for the consumption of the gas he receives should be adjusted for its safe and efficient use.

During the war, very large quantities of town gas were used in munition factories—especially in large industrial centres like Sheffield. The industrial as well as the domestic consumers were put to great loss and inconvenience through the relaxation of the legal standards which had to be permitted owing to war conditions, and the consequent delivery of gas of a quality quite unsuited to the consuming appliances which had originally been installed for gas of much higher calorific value. The loss and inconvenience due to this cause were, however, greatly aggravated by the irregularity in the quality of the gas supply from hour to hour. In the heat treatment of steel and the melting of non-ferrous metals, as well as in many other industrial operations, the control of the operations from hour to hour became almost impossible. Though the troubles of the individual domestic consumer were necessarily on a much smaller scale, they were none the less real.

From the outset it was evident that the conditions (1) and (2) could only be ensured by the establishment of some trustworthy form of recording gas calorimeter. No continuation of the present system of occasional isolated tests would meet the new conditions. Early in the present year our attention was called by the Sheffield Gas Consumers' Association to the latest instrument of this type, the "Simmance-Abady Recording Calorimeter." The Association had installed an instrument of this type at Sheffield in the later months of 1918, and charts produced in December and in the following January and February were submitted to us. From these charts—supplemented as they were by full statements as to the working and behaviour of the instrument over a number of months—it appeared to the Board that they should as soon as possible put themselves in a position to submit it to careful and continuous observation. Arrangements were accordingly made for the purchase of an instrument, and for its installation in the first instance at the head offices of the Research Department in Great George Street, Westminster. While it was recognized that exhaustive tests with gases of widely varying composition could only be made in the laboratory of the Research Station, it was believed that a useful general experience would be gained by keeping the instrument continuously at work on the ordinary gas supply of the district. It was further hoped that it would be possible to gain some information as to its behaviour under varying atmospheric conditions. To the necessary equipment of the recorder itself have been added:

(1) A standard mercury barometer.
(2) A barograph } supplied by the Meteorological Office.
(3) A thermograph }
(4) Thermometers giving the room temperature.
(5) A pressure recorder on the gas supply before it enters the first governor of the calorimeter.
(6) A specific gravity recorder. (Simmance type.)

These instruments have been under the control of Dr. Thomas Gray, or one of his assistants. The calorimeter is provided with arrangements whereby separate tests of the calorific value of the gas which is passing through it can be made without interfering in any way with the regular working of the recorder. Tests of this kind have been made several times a week; and in only one instance has a correction of more than 10 B.Th.U. been found necessary.

As Dr. Gray intends to make an exhaustive examination of this calorimeter under more varied conditions in the laboratories at the Research Station, he does not propose to issue his report till the work has been completed. The object of this present communication is two-fold: First, through your columns to let the representatives of the gas industry throughout the country know that the latest form of the Simmance-Abady recording calorimeter was installed here early in August, and that it has worked continuously under observation for two-and-a-half months. Second, to intimate that the intention in installing it for a time in this convenient and central situation was that it might be freely open (on written application) to the inspection of anyone seriously

interested in the future of gas calorimetry. The Gas Referees, the Chairman of the National Gas Council, the President of the Institution of Gas Engineers, the Chairman of the South Metropolitan Gas Company, and other eminent gas engineers and experts have visited the installation. Every desired information has been freely placed at their disposal.

PERSONAL.

At a meeting of the Heywood Corporation Gas Committee last Wednesday, Mr. RAYMOND PRINCE, son of Mr. William Prince, of Tipton, was appointed Technical Assistant to Mr. W. Whatmough, the Engineer and Manager.

Mr. W. DAWES, formerly Assistant to the Normanton and Castleford Gas Companies, was married on Saturday to Miss Clarice Conyers, of Castleford. After leaving the Army, Mr. Dawes joined the outside staff of the Woodall-Duckham Company, and at present is resident at the Brechin Gas-Works.

The Huddersfield Town Council last week approved the increase in the salary of Mr. HAROLD SINGLETON, the Gas Engineer, to £900 per year, together with house, rates, and gas free, on his taking over additional duties as a result of the Corporation's acquisition of the Longwood and Kirkheaton undertakings of the Longwood and Slaithwaite Gas Company. Some opposition was raised, on the ground that this was equivalent to an advance of £350 per year, and that it was exorbitant. An amendment was moved that the salary be £800, without house, &c.; but it was defeated by a large majority.

Mr. THOMAS GIBBONS, the Chief Collector to the Plymouth and Stonehouse Gas Company, has retired, after nearly 54 years' service. At a gathering of the staff, he was presented by the Secretary (Mr. G. H. Bolton) with an easy chair, for which employees in the office and the works had subscribed.

THE LATE MR. EDWIN SMITH.

To the brief announcement which was made in the "JOURNAL" of the death last month, in his eightieth year, of Mr. Edwin Smith, formerly Secretary to the Birmingham Corporation Gas Department, may now be added the particulars of his career that are contained in the following appreciative article, appearing over the letters "W. H. P." in the current issue of the "City of Birmingham Gas Department Magazine."

In March, 1878, Mr. Henry Parry (who had been Secretary of the Department from 1876, when the gas undertaking came into possession of the Corporation) retired on account of his health, and the appointment was at once offered, by Mr. Joseph Chamberlain (Chairman of the Gas Committee), to Mr. Edwin Smith, who was at the time Secretary of the Birmingham and Midland Institute. In the two years, 1876-77, great and radical alteration had been made in the conduct of the business in all sections, many of the department's men had not been retained, and a new army of supernumeraries had been brought in temporarily to strengthen the permanent staff. Many difficulties were encountered, and a strong man was needed to master the system, initiate improvements, correlate the work, and ensure smooth and efficient working throughout; and Mr. Smith proved to be the administrator required.

The large quantity of coke in stock was a great handicap; and Mr. Smith's earliest efforts were directed to securing the more rapid sale of this residual as it was produced. He showed great energy in establishing and developing the most successful domestic outlet for it. In June, 1878, he arranged the first of many exhibitions of gas appliances for lighting, cooking, and heating. This was held in the Town Hall, and gave a great impetus to the demand for such conveniences—especially on the easy terms offered for hire-purchase; so that to-day there can be but comparatively few houses which are without them.

When penny-in-the-slot meters came in, Mr. Smith at once grasped their significance, and issued attractively worded invitations to all property owners and house agents to install such meters for their tenants. Sanguine as he was in respect to their capabilities, he could scarcely have then realized that the Department would never from that day to this succeed in overtaking the demand for them, and that the gas supplied through them would attain, as it did last year, 20·4 p.ct. of the whole quantity sold, notwithstanding the exceptional demand by war-work factories. Another great convenience he initiated was the arrangement for payment of gas accounts at shops in the outlying districts.

It was during his term of office that the first extension of the Council House—that for the Gas Department and Art Gallery—was built. This he was particularly interested in; and, with his usual thoroughness, every detail of the planning was well thought out. The building was opened in 1885; but it was transferred to the Water Department on the removal of the Gas Department to the present offices in 1912.

Mr. Smith was the trusted adviser of the Gas Committee in everything connected with the department, and he thought no trouble too great to achieve the object which was always his first aim. The arrangements of the large contracts for ammoniacal liquor and tar were attended with great difficulties; but these were well thought out beforehand, and seldom gave much trouble when the contracts were once signed. On questions of rating, Mr. Smith was a recognized expert; and this was a great advantage when the rating authorities were so numerous as they were in his time.

NEW APPOINTMENTS AT BIRMINGHAM.

THE Birmingham Gas Committee are making two important recommendations to the City Council. They say that, following upon the resignation of Captain Hilton as General Manager and Secretary of the Gas Department in March, 1918, the Committee reported that they were taking steps to secure the services of another General Manager, and had in the meantime appointed Mr. A. W. Smith as Secretary of the Department.

Subsequently efforts were made to secure a General Manager for the Department, and advertisements were issued with this object in view; but no candidate presented himself who appeared to possess qualifications to justify the Committee in recommending him for the appointment. In consequence of this, Mr. Smith has had practical charge of the department since March, 1918; and his successful and able management during this period has impressed the Committee with the fact that he has proved his capacity for the position of General Manager. Mr. Smith has been in the service of the department for the past twenty-four years. He has had valuable experience both at the works and in the office, for several years was one of the Assistant Secretaries of the department, and possesses a thorough knowledge of the gas industry. In these circumstances the Committee have every confidence in recommending the Council to appoint Mr. A. W. Smith as General Manager and Secretary of the Gas Department as from Oct. 1, at a salary of £1600 per annum—it being understood that he will be responsible to the Committee for the management of the whole of the undertaking.

In this latter connection, the Committee are of opinion that, following the precedent established in 1902, when Mr. Henry Hack was appointed Engineer-in-Chief to the department, and Mr. Hampton Barber was made Secretary, a similar appointment should now be made; and they therefore recommend that Mr. John Foster, the Engineer at the Windsor Street works, be appointed Engineer-in-Chief to the department as from Oct. 1, at a salary of £1500 per annum. Mr. Foster has been an engineer in the department since 1902, and recently has been responsible for carrying out the large schemes of reconstruction and extensions at the Windsor Street works, particulars of which have been laid before the Council from time to time. He is a gas engineer of great experience; and the Committee have full confidence in submitting this proposal to the Council.

Both the recommendations have been considered by the Salaries, Wages, and Labour Committee, and are submitted to the Council with the concurrence of this Committee.

The Financial Position of the Gas Industry.

It has been arranged to hold a general meeting of members of the National Gas Council, at the Æolian Hall, No. 135, New Bond Street, W., at 3.30 on Wednesday, the 29th inst., for the purpose of discussing the financial position of the gas industry, and the steps in contemplation for securing relief.

Society of British Gas Industries.

The autumn general meeting of the Society will take place—under the presidency of Sir Arthur Duckham, K.C.B.—at the Midland Grand Hotel, St. Pancras, on Thursday, Oct. 30. At 2.30, there is to be a general business meeting, when a short account of the Society's work during the past six months will be given by the Chairman of the Council (Mr. Samuel Cutler, Jun., Assoc.M.Inst. C.E.). This will be followed at 3.30 by a paper by the Chairman of the Council, on the "Policy of Trading with the Central Powers." At the close of the discussion on this, there will be tea by invitation of the Chairman of the Council.

Temporary Increase of Charges Act.—The Ministry of Health have granted Orders under the Statutory Undertakings (Temporary Increase of Charges) Act, authorizing the Congleton Corporation to increase the maximum price of gas from 4s. 6d. per 1000 c.ft. within the borough and 5s. beyond to 6s. per 1000 c.ft.; and the Horsham Rural District Council (Billingshurst Parish) from 6s. to 7s. 1d. per 1000 c.ft.

Presentation to Mr. P. N. Langford.—On Thursday last the staff of the Coventry Corporation Gas Department, presented a canteen of cutlery to the General Manager, Mr. P. N. Langford, on the occasion of his marriage. Mr. Noble presided; and Mr. Matthews (the member with the longest service) voiced the general feeling that Mr. Langford's appointment as General Manager was a very popular one. In asking his acceptance of the gift as a token of the esteem and regard of the staff, Mr. Matthews expressed the sincere wishes of them all for Mr. Langford's future happiness and prosperity. In responding, Mr. Langford spoke in appreciative terms of the cordial relations that had always existed between himself and the staff, and of their hearty co-operation in the work of the Gas Department.

NATIONAL GAS COUNCIL.

Meeting of the Central Executive Board.

A Meeting was held last Tuesday of the Central Executive Board of the National Gas Council of Great Britain and Ireland, presided over by Mr. D. MILNE WATSON.

SEABORNE COAL.

Referring to the Coal Controller's Order, compelling certain gas undertakings to take seaborne Durham coal in place of railborne Yorkshire coal, the Chairman stated that communications had been addressed to the Prime Minister, to the Controller of the Coal Mines' Department, and to the Board of Trade. A letter had been received from the Board of Trade, stating that every case of hardship brought to their notice would receive careful consideration, and a relaxation of the Order made wherever justified. They could not, however, hold out at present any hopes of an extended measure of relief, as the recent railway strike had aggravated the position, and the demands on the Yorkshire and Midland collieries would be very heavy.

FINANCIAL HARDSHIPS OF THE GAS INDUSTRY.

The Chairman reported the proceedings of the Sub-Committee appointed to investigate this matter. He announced the receipt of a letter from the Board of Trade in which it was stated that they were about to introduce into Parliament a Bill relating to gas undertakings, based upon the recent report of the Fuel Research Board upon Gas Standards, and a further Bill dealing with the raising of capital by public utility undertakings. This letter had already been communicated to the Press [see *ante*. p. 72]. The Chairman added that it was hoped to have the outlines of the proposed Bill from the Board of Trade in time to submit at a meeting of the members of the National Gas Council which had been called for the 29th inst.

RAILWAY WAGONS.

The Chairman reported the formation of a Committee to deal with the position created by the Ministry of Transport Bill in regard to privately-owned railway wagons. The Committee had already met, and a further meeting was arranged to take place as last Wednesday.

JOINT STANDING COMMITTEE WITH THE SOCIETY OF BRITISH GAS INDUSTRIES.

The following names were submitted of twelve members appointed by the Society of British Gas Industries to act with the Council's representatives on the Joint Advisory Committee: Samuel Cutler, junr., Cyril G. Davis, Charles S. Bennett, George Clark, Fredk. G. Cockey, F. J. Gould, Percy F. Holmes, R. J. Milbourne, J. Winson Scott, H. M. Thornton, Fredk. C. Tilley, Fred. J. West.

PRICE OF GAS APPLIANCES.

A letter was read from the Society of British Gas Industries, giving the names of six members appointed by them to act with the Council's representatives on a Joint Committee to discuss the price of stoves: Charles Clare, Cyril G. Davis, A. P. Main, H. M. Thornton, James W. Wilson, H. James Yates.

WORKMEN'S COMPENSATION ACT.

A communication was reported with reference to the present high premiums charged by insurance companies for covering risks under the Workmen's Compensation Act. The Council had been in communication with representatives in the insurance world, and had been assured that when the present Workmen's Compensation Act is amended, the new premiums fixed will not be anything like in proportion to the cost of the increased benefits given under the Act, in view of the profits which the insurance companies have realized since the amendment of their rates to cope with the increased payments of 25 p.ct. under the Workmen's Compensation Act.

FUEL ECONOMY COMMITTEE OF THE FEDERATION OF BRITISH INDUSTRIES.

The following report was submitted in connection with the work of the Fuel Economy Committee of the Federation of British Industries: "The Committee's recommendation to form a permament Fuel Efficiency Committee had been adopted by the Executive Council of the Federation of British Industries. The Committee were requested to consider and report upon the details of the organization of the scheme, confining operations at present so far as possible to coal and other solid fuels, with a view to the progressive development of the scheme to embrace liquid and gaseous fuels and electricity. A further report has now been prepared for submission to the Executive Council of the Federation, setting out the following as the aims and functions of the proposed Fuel Efficiency Committee:"

Aims and Functions.

To conserve fuel by increasing manufacturing efficiency.
To help develop and maintain efficiency in fuel practice.
Periodical inspection of sources of fuel supply.
Investigation of practice by means of schedules and personal investigation.
Control and use of fuels—including grading, classification, and allocation.
The introduction of index figures as to consumption of fuel per unit of output.
Training of pupils.
Training of staff and workmen and granting of certificates of competency.

Finance.

Funds to be guaranted by the Federation for the first three years of the Committee's activities. During the first year the cost of the scheme in salaries, travelling, and office expenses, is estimated at £5000; but it is felt that this charge on the Federation funds would soon disappear, and the department become self-supporting. A firm obtaining individual assistance would be charged at a rate which would cover the cost of the investigation.

BRITISH ASSOCIATION AND FUEL ECONOMY.

The proceedings at a recent meeting of the British Association held at Bournemouth were referred to, at which the Council was represented by Mr. T. Goulden and Lt.-Col. W. H. Woodall.

DISTRICTS.

The Board agreed to the North Wales District being withdrawn from the Welsh District and added to the Manchester District.

BRITISH COMMONWEALTH UNION.

It was decided that the Council should apply for membership of this Association.

NATIONAL BENZOL ASSOCIATION.

The resignation of Mr. Alex. Wilson as representative of the Council on the Executive Committee of the National Benzol Association was reported, and accepted with regret. It was agreed to ask Bailie Drummond to act in his stead, or to nominate a representative in place of Mr. Wilson.

ANNUAL CONFERENCE OF THE B.C.G.A.

Draft Programme for Next Week.

IN announcing the programme for the Eighth Annual General Meeting and Conference of the British Commercial Gas Association—to be held in the Central Hall, Westminster, on Tuesday and Wednesday, the 28th and 29th inst., under the presidency of the Rt. Hon. Lord Moulton, P.C., K.C.B., F.R.S.—the Secretary (Mr. W. M. Mason) asks us to extend, on behalf of the Committee, a hearty invitation to all representatives of gas undertakings (whether subscribers or not) to attend.

Tuesday, Oct. 28.

10.50 a.m.—Conference to assemble.
11.0 —Welcome by the Mayor of the City of Westminster (Alderman G. W. Tallents).
11.10 —Presidential Address by Lord Moulton.
12.0 —Address on "Coal Conservation," by Sir Dugald Clerk, K.B.E., F.R.S., followed by discussion, to be opened by Sir Arthur Duckham, K.C.B.
Appointment of Scrutineers.
1.15 p.m.—Adjournment.
3.0 —Papers and Discussion on—
(*a*) "The Smoke Nuisance in Relation to National Health," by Dr. C. W. Saleeby, F.R.S. (Edin.).
(*b*) "The Smoke Nuisance—A Plea for Action," by Dr. Harold A. Des Vœux (Hon. Treasurer of the Coal Smoke Abatement Society.
(*c*) "Scientific Heating in Relation to National Health," by Prof. Leonard Hill, M.B., F.R.S.
(*d*) "The Hygiene of Gas and Electricity for Lighting," by Dr. Samuel Rideal, F.I.C., &c.

Wednesday, Oct. 29.

10.30 a.m.—Announcement of result of election of President for ensuing year.
Presentation of Annual Report and Accounts by the Chairman of the Executive (Mr. F. W. Goodenough), who will speak upon the "Future Work of the Association."
Discussion.
11.15 —Papers and Discussion on "The Housing Problem"—
"Practical Housing Schemes"—
"From an Architect's Standpoint," by Mr. H. Austen Hall, F.R.I.B.A.
"From the Standpoint of the Supplier and Consumer of Gas," by Mr. H. H. Creasey.
1.0 p.m.—Vote of Thanks.

The autumn meeting of the Midland Association of Gas Engineers and Managers (which was postponed in consequence of the railway strike) is fixed for 2.30 on Thursday, the 30th inst., at the Grand Hotel, Birmingham, under the presidency of Mr. A. T. Harris, of Market Harborough. There will be a discussion on the "Fuel Research Board's Report on Gas Standards," to be opened by Dr. E. W. Smith; and a paper by Mr. G. Bernard Fiddes, entitled "Some Troubles with a Two-Lift Gasholder, and how they were Overcome."

GAS ALLIES' REUNION IN FRANCE.

RECEPTION AND BANQUET IN PARIS, AND VISIT TO HISTORIC BATTLEFIELDS.

It was a small party of gas engineers, numbering about fifty, who assembled at Victoria Station (S.E. and C.R.) last Wednesday morning, with Paris as their destination and headquarters for the following four or five days. Though relatively small to the total membership of the Institution of Gas Engineers, it was perhaps as well the party was limited in number; for Paris, like London, and the other large cities and towns of Great Britain, seems to be suffering a distinct shortage of accommodation; and at the Grand and Continental Hotels where the party was to be located, it was found necessary to pair them off, so that one room sufficed for two visitors. However, we are getting ahead of time in our record. We are at Victoria Station; and the members of the party, despite all difficulties of the current situation for responsible gas managers, were in high spirits. The bright morning, and the crisp frostiness about the atmosphere, were calculated to make men of customary genial disposition show the characteristic at its best; and there was the interest about the trip. It was being made at the courteous invitation of the President, Council, and members of the Société Technique de l'Industrie du Gaz to the gas engineers of allied nations; and this alone was a sufficient cause, after all the respective countries have been through during the past five years, to make the occasion one of unique interest, and to engender a desire to let heartiness cast its sunshine over the event, because it is hoped that this is but the prelude to fairly frequent reunions in the interests of the gas industry, the fortunes of which all gas engineers of the allied countries have genuinely at heart.

Breakfast on the train seemed to shorten considerably the journey to Folkestone; and while on the way, one was—the carriages provided for the party being saloon ones—able to run round, and shake hands with old friends. It was learned with regret from Mr. W. T. Dunn, the Secretary of the Institution, who was early on the scene superintending and looking after the countless details that seem to grow in number on such occasions, that the President (Sir Dugald Clerk) was unable to be with the party. But Mr. Thomas Goulden, the Senior Vice-President, was there as the official head of the British contingent. He had good support, too, from the ranks of the Past-Presidents. There were (given in the order of contact) Mr. John Bond, Mr. W. Doig Gibb, Mr. Samuel Glover, Mr. Thomas Glover, and Mr. Charles Wood. And here was Mr. W. E. Price, the Hon. Secretary, as vivacious as ever. Mr. J. D. Smith, a member of Council, had come over from Belfast, and so Ireland was well represented; and, by the way, Scotland and Wales had also sent a representative contribution. As visitors there were Alderman Ball, of Nottingham, and his son, the latter of whom found an interest now that peace has been restored in visiting the scenes of some of his own air exploits and those of his gallant and honoured brother, whose life was so eagerly sought by the country that had felt so keenly his ability and courage.

By 11.30 we were at Folkestone and on the steamer *Victoria*; and before one o'clock, we were at Boulogne, where in the dining saloons attached to the train leaving at 2.30 for Paris, lunch had been provided for the party. Punctually to the appointed time, we started away; and through country that hereabouts shows little trace of having been at war. The scars are elsewhere, as we were to see; and others—many, deep, and melancholy—are to be found in almost every home of our brave and courteous allies. At Amiens we saw the first traces. There is no glass left in the station roof; and its framework is damaged in several ways; and a little later before darkness set in there were seen a few trenches and dugouts—probably precautionary ones—which were in process of being filled in. On arriving at the Gare du Nord, Paris, there was great gratification over the act of courtesy of MM. Ellissen, Verricong, and Henri Bouron (Secretary) in coming to bid the members welcome in the name of the members of the Société du Gaz. The journey had been long, but the day having been fine and the company of the right sort, the hours had slipped by pleasantly. Nevertheless the members were not sorry when they reached the hotels to which they had been allocated.

In the Scenes of Battle, and the Ghastly Memorials of a Great Vindictiveness.

We were astir betimes on Thursday morning. The courier assigned by Messrs. Thomas Cook & Son believed in having time on hand to ensure punctuality and smooth running. It is a good plan. Some were out of bed soon after five o'clock, breakfasting at six; and by 6.30 all were on their way to the Gare de l'Est. It was to be a day to which we had been looking expectantly; and there was not disappointment, although the fresh sunlit morning gave place to an afternoon made unpleasant by hard rain. At the Gare de l'Est, there was met a representative body of the Société Technique du Gaz, headed by their President, M. Laurain, although during the functions of these memorable days for those who took part in the visit, the more conspicuous position was taken by the Past-President, M. Francis Rouland, the Administrator of the Société du Gaz de Paris. There was also among many other faces, old and new, M. Brutus Verrieux, one of the Engineers of the Société du Gaz de Paris.

We then heard for the first time, to the sorrow of all, that no representatives were to be present from the Italian Society, owing to the difficulties of travel and other things. But the Belgian Association had sent a good deputation. There were M. de Gand, the President, M. Busine and his son, M. De le Paulle (Brussels), M. Timmermans (Secretary), Messrs. Maurice and Joseph De Brouwer (Bruges), Mr. Coene (Ghent), Mr. Casaubon (Brussels), Mr. Prisse (Brussels), and Mr. A. F. P. Hayman (Antwerp).

It was a journey full of interest. We had opened to us in panoramic view (so to speak) the fringe of some of the material damage of war, into the thick of which we were to be precipitated on arrival at Rheims. The line took us along the valley of the celebrated Marne, which was crossed two or three times before reaching Meaux. Then we continued along the valley to Chateau-Thierry, the farthest point reached by the Germans in their break-through in 1918. Then through Dormans, the scene of the bridge-head the Germans made across the Marne, when the Americans came in, and eventually drove them back. Then on to Epernay, and through the Forest of the Mountain to Rheims.

Long before we got to Rheims, the horrors of the great destruction were forced upon us. And sympathy and resentment were mixed together, and were to be intensified later. We saw the landscape, miles upon miles of it, lined with sinuous trenches—some filled in, others still to be; we saw how thickly the ground had been lacerated and pitted by gun-fire; most trees burned and blasted; trees with trunks standing out bare, and Nature exerting herself to repair the damage by sending out new shoots at the base. Severed telegraph wires were hanging idly swaying in the wind. But worse than all—many villages are passed through that have been wholly wiped-out. Their little streets are complete wrecks. Buildings that were once homes have been brought to the ground by the ruthless ravager. There are houses with pieces of their walls standing as memorials to their previous existence, and to the hate of the enemy. Some cracked and torn have their windows boarded up. They are still homes; but poor broken things for defying the elements and atmospheric conditions this winter. At the ends of villages are seen wooden huts, where some of the former inhabitants of the comfortable stone-built houses are endeavouring to live a civilized life amid scenes that speak in vivid terms of uncivilization and gross brutality. There in the village or in the distance one sees what were churches now heaps of ruins—good marks for the unbridled ferocity of the German gunners and their masters. Factories and shops have met the same doom. Fismes is a complete ruin. Its streets are almost deserted and silent. A few people have still clung to the scenes of their former happiness. Along the lines, the trains go carefully where there are bridges. Some were destroyed by gun-fire; others were blown up. Where there were railway stations, there are wooden erections doing what business there is to be done for the railway from these broken places. As Rheims is approached, the scenes grow worse. But above all the observation, above all that is seen, above all the pity for ravished France, there rises the thought, "What does all this mean in the sacrifice of human life, in lives physically wrecked, and in human happiness? The estimate is beyond the power of man.

Here we are at Rheims—with the station buildings pitted so that hardly a square inch of the face of the stonework appears to have escaped. Parts are boarded up. Internally, one might imagine the various offices to be representative of buildings in the great westward backwoods of America. This station is the gate to scenes of, in words, indescribable character. We have all read of these things in the newspapers. The accounts have not stirred the imagination to realize the actual. This was at one time a great busy centre; it is not so to-day. But the people of Rheims are brave; they are starting in perhaps a small way its reconstruction. And German prisoners are there (some who look at the visitors with insolent stare) helping to attack the gigantic litter of what once constituted Rheims. But it will take the span of a generation or more to build a new Rheims. Just outside the station, business has been started again in a few shops of wooden construction. Elsewhere ruin is complete. It is the same thing everywhere. In street after street, what were fine buildings or homes, are heaps of rubbish; the buildings that are still standing are cracked, torn, or injured in some way. If one can imagine the Germans starting systematically upon the destructive work by taking street by street, and each house successively as a target, then perhaps some conception can be formed of the complete ruin of Rheims. When it is remembered that the Germans were at Berry-au-Bac (which the party drove out later to see), and were in occupation of Hill 108 and Fort Bremont for some four years or so, and that from the Fort they bombarded Rheims throughout that period, then it is better realized by people who have not seen but have only heard what Rheims has suffered. Let us try to make figures speak of the destruction. Some 14,000 houses have been completely demolished, 2000 are reparable, and only seven houses can be found in the city that have not been touched. Some 40,000 of the inhabitants out of a former population of 130,000 have returned. It is one of the mysteries of Rheims to-day how 40,000 people can live in it, and get their supplies. For of shops there are few; and these mostly are the boarded-up ground floors of what were shops, and the few wooden ones that enterprise has erected; and there are only two or three parts of

hotels that are doing what slender business there is to be done, and that under conditions that do not look altogether weather proof. The Germans had a pretty good knowledge of Rheims; for in 1914 it was the headquarters of the German Crown Prince before the big battle of the Marne, and then for some four years the German troops were lying a short distance out, from which, as said, they could consistently bombard the town.

Soon after our early morning arrival, we started through destruction the like of which none of the party before had ever witnessed. We came to what were once the gas-works. There was descent from the cars. The works are divided by a road the walls of which have been pierced by shells. All was silent. No one was there to grant or deny admission. We went into the part where a gasholder with shell-torn sides, battered standards and girders, badly damaged roof, lifts and wreckage (as seen through the shell holes) in confusion inside the tank, was standing evidence of a useful past and a useless present. There is a grave near by with a wooden cross; and another mound near. Out from somewhere came a man, dressed in the blue of the French workman, bid us welcome, and stood interestedly watching the visitors making searching investigation of the deserted works. Across the way, the manufacturing plant is a wreck; and nothing can be done with it, though parts may be brought into use again when there is reconstruction. Nothing escaped the deluge of shells—not even the gasholder on this part of the works, with its brick-built columns.

But we could not stay here long. There was so much to be seen. The motor cars were remounted; and then we started through more continuous indescribable destruction on to the famous Road 44, along which the German hordes passed and used so continuously. It runs in a direct line to Berry-au-Bac; and our drive takes us to that place and the famous Hill 108. All about here is still ample evidence of the fierce fighting for the command of the Aisne Valley towards the Chemin-des-Dames. The road itself is bordered by trees, with wires connecting them, and in places the straw or other curtains, which the Germans used for obstructing view of the movements of their troops, are still fluttering in the winds. The trenches thread their way everywhere. Barbed wire is about in indescribable confusion. Some is rolled up ready for removal; some lying on the ground; some—miles and miles of it—still attached to the supporting posts. Dugouts, strongly protected, are numerous. They were wanted. The intensity of war hereabouts was at white heat. Here is No Man's Land, a scene of vast desolation, with Hill 108 in the background, from which the French drove the Germans and broke through their lines in 1918, which was the beginning of the end. Hereabouts there is still to be seen the refuse of war. Here a gun carriage wheel; there other lumber; here a German ammunition train which was blown up; and sundry goods of many descriptions are being collected. Little cemeteries by the wayside are here with wooden crosses, marking the resting places of French and German soldiers, side by side. German prisoners are remaking the surface of the road, and clearing away the bordering heaps of lumber. It is all repetition along the miles of this now historic highway.

We are at Berry-au-Bac, or what was Berry-au-Bac. It exists only in name. All that was material about it has been blown out of existence. There is a wooden shanty of a place, where refreshments can be obtained if one is not too particular about the service, and one or two huts where photographs and relics can be purchased. The only thing that shows there was at one time urban life here is the shattered remains of the large sugar works, about which we have often read, and have now seen. The place was mined by the Germans before leaving, and the works, or what is left of them, are now only useful for sale as scrap. Here we foot it to the famous Hill 108, to inspect the huge craters, formed as the result of a tedious but persevering piece of successful work which the French undertook. Where these craters were was the centre of a great ammunition collecting organization, where the Germans worked in their thousands, and whence the enemy armies in these areas were fed with ammunition. From their position far away across No Man's Land, the French laboriously tunnelled, unseen and unheard; and under the centre of this great organization some thousands of tons of explosives were placed, and in due season up went the whole organization, and nothing remains of it now. The place and the deed are marked by three huge craters of considerable diameter—one of them 60 ft. deep, and all in chalk. The chalk gathered on the walk up the hill to look down into the results of this marvellous venture—now hiding God only knows what—obtained good adhesive property for boots, as rain began to descend while we were there. But before we left there were seen the barges, left behind on the canal by the Germans in their hasty retreat, which used to bring German coal to this position, and much of which coal is still stored there. From the rain refuge was sought in the motor cars and soon we were whirling back to the ruins of Rheims, where luncheon was provided at the much wounded Hotel Degerman. Never has luncheon been previously partaken of by British gas engineers under such curious conditions.

After lunch, we visited the Cathedral whose torture by shell fire has so often been described. The sacred and noble edifice is not past repair; but only time and much money can renovate it. Its towers and roof have suffered considerably, and so has the face. Internally there is not so much damage as might have been expected. The beautiful columns are intact; the arched roofs have a few nasty shell holes through them. The windows have gone, and so have the main doors. Seeing that there were many hundred shells dropped upon the building, the result is wonderful. The celebrated rose window, and much of the other valuable things, were removed for safety to Paris. We then saw more of the city; but it was the same as all the rest. The world will be set back by all the labour required in reconstruction, of which Rheims is but a bad sample.

Just before five o'clock, we were on our way back to Paris. The train was late; and it was well after eight o'clock before the hotels were reached. All were ready for their evening meal, and to chat over the impressions of the day and the scenes.

At Paris Gas Stations—The Landy Works.

Next morning, the visitors, English and Belgian, had for their hosts La Société du Gaz de Paris. They were first taken by motor car to the Landy Gas-Works, where they were received by M. Rouland (Administrator), M. Laurain (Consulting Engineer), M. Labru (Chief Engineer), and M. Laedlein (Directeur des Services). The reception was most cordial and happy. The works were decorated on the gates and the offices by flags. To enable the visitors to obtain an indication of the general lines of the works, the following description was circulated:

These gas-works were completed in the year 1911. The original scheme foresaw a total daily productive capacity of 24,721,550 c.ft. of gas (700,000 cubic metres) through the construction of four retort-houses, each of them containing six benches, thirty-six settings of nine retorts each, 19 ft. 8 in. in length.

When the Société du Gaz de Paris undertook the supply of gas to the city, only retort-house No. 1 was erected, with retorts heated by gas-producers and regenerators, but was not then provided with mechanical appliances for charging and discharging them.

The Société started in 1908 the installation of retort-house No. 2, fitted with coal and coke conveyors, and charging and discharging machines. About the same time (in 1909), mechanical handling was introduced to retort-house No. 1; and, finally, the Landy gas-works were completed, in 1910 and 1911, by the building of retort-houses Nos. 3 and 4, and of the accessory plant. At the present time, the works consist of 1296 through retorts, each 19 ft. 8 in. in length, yielding, with coal of the average quality, 24,721,550 c.ft. in twenty-four hours. This means a minimum output of gas of 10,765 c.ft. (300 cubic metres) per ton of coal.

This large increase in the coal carbonization power of the works involved the construction of the following plant: A second exhauster-house, with two sets of two Beale exhausters, steam-engines, and steam-boilers. Two gas-washer houses with Pelouze and Audouin tar-extractors, and naphthalene and ammonia washers. Three purifier-houses, out of which two are fitted with boxes built on the Jaeger principle (termed cuves-monobloc), and provided with mechanical implements for the transport of the purifying material. Three gas-holders, each of 5,297,475 c.ft. capacity (150,000 cubic metres). Two of these holders (Nos. 6 and 7) were erected in 1909-11. The last one (No. 8), of quite another design, with curved steel water-tank, was started in 1913, and completed in 1914. In addition to the former meter-house, nine duplex station meters, each of 2,118,990 c.ft. per diem capacity (60,000 cubic metres), were provided for. To ensure the distribution of the 24,721,550 c.ft. of gas produced by the works in 24 hours, three gas-compressors of 812,279 c.ft. per hour capacity (23,000 cubic metres) were installed in 1910.

To supply the necessary power to all the machinery in the works, a central electric power station was erected in 1908 and 1909. The energy is utilized by the coal and coke conveying plant, coal-breakers, charging and discharging machines, washers, purifying material transporters, water-pumps, gas compressers, &c. The power-house contains: Eight steam-boilers, with mechanical stokers. Four Dujardin steam-engines of 600 H.P. Four dynamos of 400 KW. Two boosters in connection with the batteries of accumulators.

It may be stated that the output of gas increased from 21,437 to 51,491 c.ft. (607 to 1458 cubic metres) per man per day, by the installation of the charging-machines (annual average). The total cost of building the new Landy works from Sept. 1, 1907, reaches an amount of £1,460,000 (36½ million frs.).

M. Rouland addressed a few words of welcome to the members on their arrival; and then they at once proceeded to inspect the plant, from the coal coming into the works to the final distribution of the gas. It was heard that eight-hour charges are worked; and it was seen that the machinery used is of the De Brouwer type. The coke is barrowed-out of the retort-houses into conveyors, leading up to reinforced concrete hoppers. The aggregate storage capacity of the gasholders, including the ones mentioned in the prepared particulars, and some smaller 1 million ones, is approximately 20,045,000 c.ft. In connection with the electric generating plant (400 KW. sets, 250 volts), it was remarked that tubular boilers are used, fired by breeze, with forced draught, practically as in the Wilton steam-injector system.

One thing which the members particularly noted was the state of neatness and cleanliness of the works. They are also in excellent repair, considering there have been four-and-a-half years of war, and Paris was so near the seat of war.

The cost of coal on to the works is now about £7 per ton. British gas-works are not the worst done by in this respect. Regarding the quality of the gas, so far as could be gathered, it is of between 4800 and 5000 calories per cubic metre—say, 539 B.Th.U. less 7 p.ct. for correction, which would be approximately 500 B.Th.U. Throughout the war the works were busy extracting products for high explosives; but the process has now been abandoned. Gas rationing is still in operation, under which consumers are to all intents and purposes fined for exceeding their ration by having to pay more for the gas. The charge is 30 c. per cubic metre up to 50 cubic metres per month. If the consump-

tion exceeds the 50 cubic metres per month, 40 c. is charged per cubic metre.

A very interesting plan or map was shown of the lighting of Paris during the war. There are about 60,000 lamps in the city. While the war was on, some 21,000 were in use before 10 o'clock, and this number was reduced to 8000 after 10 o'clock. Every lamp that was lighted during the war is shown on the map by a pin-prick. By having the map suspended with a light behind it in a dark room, the effect of the lighting at night time can be seen. One thing that was learned from a study of the map was that it was a bad thing to leave patches of darkness, as this suggested to enemy airmen that there was something in these dark patches that it was specially desired to preserve. For instance, in the case of the Eiffel Tower, this showed up as a black patch on the map, as it did actually at first under the conditions of lighting at night time; so that a little more light was arranged about it after dark. This map is a capital educational idea for such purposes in times of war.

Before leaving the Landy works the members had refreshments in the meter-house.

At the La Villette Works.

So much of the morning had been instructively occupied at the Landy works that there was not much time to visit the La Villette works (an item, by-the-bye, not on the programme); but several of the members were anxious to see there the Munich inclined chambers. The station was reached about 11.45. The major part of the carbonization is on the Munich system; the chambers being set at an angle of 32°. The charges are 4½ tons of coal per chamber. For these chambers there is a special machine for slaking the spent charges, and for distributing the coke into conveyors before being elevated to the reinforced concrete hoppers. The coke is not used for special metallurgical purposes, but for general domestic use.

Before leaving the Landy station M. Rouland said how pleased he was to welcome the allied visitors to the works; and he hoped they had been interested by their visit. The Senior Vice-President of the Institution (Mr. Goulden) responded, and said how gratified the members had been to have had an opportunity to look round these modern works. He also referred to the abounding cleanliness, which reflected the perfect way in which the works were constructed. Cheers were given for M. Rouland, and those of English tongue could not refrain from singing "For he is a jolly good fellow." And so he is.

At Versailles.

In the afternoon, the party paid a visit to the Invalides (the Emperor's Tomb), and afterwards to the Castle of Versailles, where the Gallery of Glasses was seen, in which the Treaty of Peace was signed.

The Banquet.

In the evening, there was a banquet, in honour of the British and Belgian visitors, at the Pavillon Laurent, on the invitation of the Société Technique du Gaz en France. M. Rouland was in the chair; and to the right-hand side of him sat Mr. Thomas Goulden, and to the left-hand side M. de Gand, the President of the Belgian Association. French, Belgian, and British were allocated seats, so that the mixture of nationalities was complete—a very delightful circumstance in some cases, but a little awkward where neighbours had no choice of alternative language from their mother tongue. Nevertheless this was a small matter. Heartiness prevailed. All were glad to be there; and so pleasure flowed uninterruptedly. From every British and Belgian lip the event, which was the crowning point in these days of reunion after the great war, has been voted a huge success. There were three outstanding speeches of excellent quality in eloquence and matter—delivered by M. Rouland, M. de Gand, and Mr. Goulden. These speeches we shall be reporting next week. Meanwhile, it may be mentioned that the toasts of the President of the French Republic, of King George, and of King Albert were honoured; and the appropriate National Anthem was sung after each toast, and sung enthusiastically, accompanied by the band.

Before drinking to the health of the President of America, Mr. Rouland said the American Gas Institute had replied to the invitation to be present in a communication which was full of cordiality. Translated, it read as follows: "The American Gas Institute cordially appreciate the invitation of the Société to be represented at the reception of Gas Associations of the allied nations. We regret that, in the limited time at our disposal, it is not possible for us to nominate a representative, as the general assembly of our Association will be taking place in New York at the same date as the reception in Paris. We send you our fraternal thanks, and our best wishes for the success and the prosperity of the gas industry in France.—(Signed) G. B. Cortelyou." But, gentlemen, we have (continued M. Rouland) been advised that the American Gas Institute will be represented in our midst by the very sympathetic President of the English delegation Mr. Goulden. I ask you to acclaim free and generous America, and to drink to the health of President Wilson.

Proceeding, M. Rouland said: Gentlemen, before going any further, I wish to address consolation to those not present at this our allied conference, but who participate with their hearts and thoughts in this reunion, and who, through adverse circumstances, have been prevented from joining us during these three days. Our Italian *confrères* through their amiable President, M. Sospicio, on Sept. 25, sent this telegram: "Our Association accepts with pleasure your kind invitation to participate in the gratification of saluting on the fields of Rheims and Arras the sublime union of French and Italian blood, spent so generously, and for the realization of French as well as Italian aspirations." At the last moment, President Sospicio has expressed to us his very great regret that the Italian gas engineers, by reason of the situation created by the internal disturbance of the country, have been unable to join us to-day. At the same time, the Italian gas engineers have charged their colleague, M. Chamon, to carry out for them the pious duty of placing a tribute upon the tombs of those of the allied nations who died for freedom. Those present drank to noble Italy and to the prosperity of the Italian gas industry.

In a brilliant and eloquent speech, M. Rouland proposed prosperity to the British and Belgian gas industries. To this speech, there were replies by Mr. Goulden and M. de Gand. Then Mr. Goulden proposed prosperity to the gas industry of France, coupled with the name of M. Rouland; and again there were cheers and singing of a character in which the British voices predominated. Our French hosts were much interested and pleased at this display of vocal heartiness. After partaking of coffee, with the warmest sentiments of friendship, hosts and guests parted for the night.

More Work of the Ruthless Destroyer—Scenes at Arras, Vimy Ridge, and Lens.

The whole of the British and Belgian party and several of their French friends were astir early on Saturday morning. They had a long day before them—for they were going far afield to see more of the sad and destructive work of the Germans, who have set back by many the years for France. Even with the early start—7.15 a.m.—the hotels were not reached again before nearly ten p.m.

From the Gare du Nord, train was taken for Arras, and the itinerary included the Vimy Ridge, Lens, Souchez, Neuville-St. Vaast, and the Labyrinth, all of which places are historic, and the scenes of very violent fighting. We thought on our visit to Rheims that the very apex of what criminal war could mean had been seen. On this journey worse was witnessed. We saw what were large and thriving places nothing but heaps of ruins, made so by a satanic hate, and by those whose deeds show the depth of their immorality. We once regarded the Germans as civilized. How can anyone who has seen what we have seen so continue to regard them?

The train once again takes us into the war zone. We see first Mericourt, as brought to ruin and desolation. We see isolated wayside graves; we are destined to see large cemeteries containing the gallant dead—British and French; and, with the soil of France countless German bodies are also mingled. Those interminable trenches, the barbed wire, the refuse of the battlefields, the great salvage dumps, and the shell holes, are constantly within our vision. But a sight along the line are the miles upon miles of country passed through with the trees without a leaf, without bark, with apparently all life taken from them. What did this evil? Was it gun fire only? Could it have stripped so clean and thus deadened so completely flourishing trees? Or has the poisonous, suffocating gas had anything to do with it? There are now deserted compounds and camps. Here is the once bright and happy Albert, a grim wreck, together with the gas-works. Their former place is now only marked by relics. A good specimen timber town has sprung up at one end of the place. We see a lot of this sort of thing among the destruction. Reconstruction is beginning in primitive style, by the erection of comely-looking wooden structures, or (less attractive) of any odd material that can be found among the wreckage. It is sad to see the poor with their little wooden houses, built of any odd material on which they could lay hands. But these people are brave. Disaster is being met in strong spirit. The gaze meets flooded lands and broken railway bridges. We wonder where this tale of havoc all ends. A large patch of rubbish is pointed out; and it was called, and is still called, Mesnil. Miraumont, Achiet and Achiet-le-Grand, Gommecourt, Courcellas, Moyenneville, have names upon the map; but a confusion of bricks, dust, and wood is all that met the eyes of the travellers. There is much of the paraphernalia of war about. Narrow-gauge lines, emplacements for guns, telegraph and telephone lines. Here is Boisleux, where the British were in 1916 in the Somme campaign. It rained shells here. There is Agny—ruined. We gaze and wonder. A people who object to be called Huns and uncivilized made barbarous work among helpless people and their homes. A visit to these scenes, and one's heart hardens. Yet there is still worse.

Here we are entering Arras; and the train passes by some decent wooden homes that have been hurriedly erected. But Arras itself is badly damaged; and the fine Town Hall and other buildings are destroyed. But it is not with the completeness of Rheims, and Rheims is not as Lens. There are more shops remaining in Arras—knocked about, but still there and doing business. The work of renovating the station is well in hand. We board motor cars, and are soon in the outskirts of Arras, where the destruction is as finished as at Rheims. We then start on a journey over one of those long main roads intersecting battlefields, which were the scenes of some of the fiercest conflicts in the war. It is all as before described, but worse. On the left-hand side is seen a cemetery well kept, with its rows of mounds and little white crosses. We read on a board: "Nine Elms British Cemetery." We pass along the great Arras road, bordered by the ground of fierce fighting and gun firing. All a'ong, stretching

away to Lens, the earth (quite apart from trench work) has by the intense shelling been thrown up into hillocks separated by deep cavities. What manner of diligent work will be required to bring this extensive area to a useful state again cannot be divined. But why this? The explanation is found in the strategic position—the Vimy Ridge, which we are approaching, and farther along the Lens coalfield—the Newcastle of France. Here we are at one part of the Vimy Ridge. We stop to look at a monument, lately constructed; and a brass plate tells us it has been erected to the memory of officers and men of the Canadian Corps Artillery, who fell during the Vimy operations, April, 1917. We pass along through the same picture of destruction and the military work and waste material left behind to the Lens Road. Of the whole of this district, the Germans were in possession in 1916. General Byng was in charge here; and—this was in 1917—he dropped upon the German position approximately a million shells, succeeded in pushing them back, and they never again regained the ground. Farther along we came to brickfields about which we have read, and round which were most sanguinary battles. Cemeteries come within reach of vision all too frequently; fallen trees, trenches, dug-outs are more numerous. It was warfare here on a large scale. We cross a canal, containing much wreckage and broken boats; and by the wayside are many improvised homes.

We are now in the midst of the ruins of Lens, where once beautiful buildings stood boldly and good to see. But there is nothing left of this prosperous centre of a coal-mining industry except mounds, we might say mountains, of *débris*. We see a picture of the main street as it was. There is nothing there now but rubbish. We ascend a mountainous heap; our informant tells us it is all that remains to mark the place of the beautiful cathedral. This was not the work of bombardment only; but the wantonness of the Germans who systematically mined the whole city, and blew it up before leaving. The savagery of the whole thing is sickening! Along the main roads we see bits of gas-lamp columns, some still standing; but we cannot trace where the gas-works were. Our guide points to various places where were the coal-pit heads. The machinery has all been blown up, and the mines flooded. It is calculated that it may be ten years before these mines can be fully restored. We have had our fill of the work of these savages in the disguise of men.

On the return journey we passed Souchez and the ruins of the famous sugar factory; and then stopped at Neuville St. Vaast, or what was the location of the place of that name. At the corner where four roads meet, we stop to visit the cemetery where are buried the British and French who fell hereabouts. It was a very sorrowful visit. The wooden crosses at the heads of the graves stretch out in long uniform lines. But a gruesome sight must be first passed. We look into a deep, wide pit-like trench. Germans are working there. As the gravel is removed, revealed are the forms of men, uniformed and booted, as laid to temporary rest, amid the fury of war, side by side. These are men who fought, and made the last great sacrifice. We stood bareheaded in sympathy, admiration, and respect. We pay the penalty of the desire to visit the cemetery by an imperishable memory of what was seen.

Who has not read of the Labyrinth of Neuville St. Vaast—an underground stronghold, cut out of the stone by the Germans, and which was capable of accommodating a whole division of men? One has here to be careful of hanging and fallen electric wires, of worn and broken steps and projections with which it would be uncomfortable to come into contact. We descended innumerable steps into what seemed to be the bowels of the earth. Nothing but two or three candles carried by our child guides gave us light. But it was worth all the trouble and inconvenience to have had the experience of visiting this historic and marvellous creation, in which there were 400 Germans when the British captured it.

But time was flying; and we must get back to Arras for a late luncheon. This was taken at the Hotel du Commerce. In the afternoon a more intimate acquaintance was made of the destruction in Arras; and later on the train for Paris was boarded. It was somewhere in the neighbourhood of ten when the tired but gratified travellers reached their hotels.

The Return Journey.

Paris was left on Sunday at noon. On our way to Boulogne, we had to pass the great base camp at Etaples; and there from the train window we saw a cemetery covering acres—with the same universal little wooden crosses as away yonder in the Marne and Somme sectors. That was the last deep impression of ours while on the soil of France on this trip. We were timed to reach London at 9 o'clock. The arrival was nearer 11 o'clock, and by the time many had cleared the Customs, it was 11.30. Although the five days were strenuous ones—the nights short, some of the meals hurried, and over 1000 miles had been traversed by rail and road, not including foot work—there is not one of the party who would have missed taking part in it. To call the journey a successful one is but ill-description; and for much of it we have to acknowledge our gratitude to our amiable French colleagues.

The Manchester District Institution of Gas Engineers will hold their quarterly meeting, under the presidency of Mr. A. E. Mottram, of Ossett, in the Grand Hotel, Manchester, at 2 o'clock on Friday, Oct. 31. The business includes a paper on "Improved Methods for the Analysis of Coal Gas," by Mr. W. Buckley and Dr. F. S. Sinnatt, M.B.E., F.I.C.; and a discussion on the "Proposed Tar Scheme between Producers and Distillers."

ELECTRICITY SUPPLY MEMORANDA.

Under the Statutory Undertakings (Temporary Increase of Charges) Act, electricity supply companies are in a much better position than the majority of gas companies. They have no sliding-scale and no standard price. As the Act provides that the dividend shall be three-quarters of the standard dividend or the pre-war rate of dividend, whichever is the lower, the electricity companies—having no standard dividend—have an allowance of three-quarters of their pre-war dividend. The companies who were then paying good dividends rejoice that they are not in the same street as sliding-scale gas companies, but that they can go on charging their maximum rates until they get to the three-quarter level of the pre-war dividend; and then, when this is threatened, all that has to be done to protect it is to apply to the Board of Trade. The Board have of late been dealing with numerous applications by electricity companies for increases in their maximum prices. We see that the Hindhead Electricity Company have applied for an increase in their charges, so as to enable them to pay a dividend of 4½ p.ct., being three-quarters of the pre-war rate. The Farnham Rural District Council regard this as reasonable, and have decided not to oppose. The Chelmsford Corporation have been considering a notice of an application by the Electricity Supply Corporation, Limited, for an increase to 10d. of their maximum price of 8d.; and they too have resolved not to oppose any reasonable increase which the Board may determine to allow after duly investigating the financial position of the Company, and ascertaining that any modification granted would not be more than sufficient to enable the Company to pay a dividend at three-quarters of the pre-war rate. Sliding-scale gas companies would be mightily glad if they were in similar position. It would have been much fairer if there had been equality between all concerns; and three-quarters of the pre-war dividend had been temporarily allowed, until there was adequate re-adjustment for all gas and electricity undertakings irrespective of whether they were sliding-scale or maximum price companies. However, the Board of Trade have promised the gas industry a Bill which will revise its financial conditions. It is hoped that the proposals will mean justice to old investors. New investors can obtain the best of assurances, seeing that they will not put capital into commercial undertakings to-day unless good interest or dividend is offered to them.

Three-Quarters of the Pre-War Dividend.

Electricity in Disfavour for National Kitchens.

When the National Kitchens Division of the Ministry of Food rather more than a year ago issued their "Handbook on National Kitchens and Restaurants," electric appliances were exceptionally well illustrated, and gas appliances less so. In the text, there was an attempt to give electricity a little "leg-up." But the praise was of the faintest; and those who could read between the lines saw in it something that was non-committal. Electrical people were not sure whether to be glad or sorry; but on the whole they thought that those responsible for the "Handbook" intended well to electricity. We may recall what was said in the book:

> At present the last word can hardly have been said on electric cooking. If supplied for not more than 1d. a unit, it is a very satisfactory agent for roasting, as the loss of meat in weight is less, basting is less frequently required, and a pleasant nutty flavour is given to the joint. The cost of current, however, becomes excessive unless careful attention is given to turning-off switches to low, medium, and high, according to the directions given. An electric-griller, when wanted for only a few minutes at a time, is very convenient; and an electric deep fryer is also recommended. Heating water or soup by electricity in kettles or stockpots is slow and expensive, unless the utensils are specially constructed for the purpose. Whenever electricity cannot be supplied for 1d. or less per unit, it will be found better to use gas, if it can be obtained at not more than 3s. per 1000 c.ft.

We discussed these statements in the "Journal" for Sept. 3 last year. Now the sequel comes after about twelve months' working experience. This was mentioned in another part of the "Journal" last week; but it may have escaped the notice of the electrical readers of the "Memoranda," and so repetition will not be amiss. Before the page of the "Handbook" on which the above quoted statement appears has been inserted the following statement:

> The National Kitchens Division has now had extended experience of cooking appliances, and still advises the use of steam, when available, for heavy duty such as boiling-pans. Owing to serious alterations in prices, &c., the comparison between gas and electricity should be ignored. The division's experiences of electricity for cooking have been anything but favourable. Gas appliances are more constantly reliable, and much cheaper to instal and maintain; and they consume less fuel.

That pell-mell rush of the electrical people to get into the National Kitchens with their electrical apparatus, and the bombastic descriptions of great doings, are brought back to mind as we read: "The division's experiences of electricity for cooking have been anything but favourable." This will be a heavy blow for our electrical friends who had built such big hopes on shifting sands. The experience of the Kitchens Division has not been small; and it has been with varied apparatus of the very best makes.

There is no qualification—the experiences "have been anything but favourable." And the commendation of gas will only make the blow the heavier for the electrical people. The results of experience expensively bought are difficult to remove; and their circulation declines to be stopped.

Electric Lamp Prices Reduced.

There will be interest in the announcement made by the Electric Lamp Manufacturers' Association that, as from the 1st inst., the price of the misnamed "half-watt" (better termed "gas-filled") incandescent electric lamps have been reduced. The ability to lower prices in these hard times is stated to be due to painstaking and expert research which has enabled commercial production to be effected on more economical lines. It will be seen that the reductions affect the higher power lamps to a greater extent than the lower power ones. It will also be noticed that the renewal of one of the lamps is a matter of considerably more importance to the pocket than is the renewal of an inverted gas-mantle.

Rating in Watts.	Old Price.	New Price.	Rating in Watts.	Old Price.	New Price.
	s. d.	s. d.		s. d.	s. d.
15 . . .	4 6 ..	4 3	300 L.V. .	25 0 ..	20 0
30 . . .	5 6 ..	5 0	300 H.V. .	30 0 ..	20 0
60 . . .	6 6 ..	5 6	500 . . .	30 0 ..	24 0
100 . . .	12 6 ..	10 6	1000 . . .	40 0 ..	30 0
150 . . .	16 6 ..	13 6	1500 . . .	50 0 ..	37 6
200 . . .	20 0 ..	16 0			

Photometrically the 0·5 watt swells to about 0·75 watt per candle power; so that, instead of an efficiency of 2 candles per watt, it is actually in the neighbourhood of 1·33 candles. Thus a 1000-watt lamp should give per KW. hour 1330 candles, or thereabouts, and not 2000 candles. But the lower candle power is again diminished by the fact that the high intrinsic brilliancy of the lamps necessitates their shielding; and this in turn adds to the cost of installation, as well as increases the fittings that require cleaning. In making comparisons of running costs, the low-power lamps used for domestic and shop lighting will be on the ordinary lighting rate, while the higher power lamps used for street illumination will be charged on the local street rate. The higher powers, too, will come into comparison with high-pressure gas lighting both for factory and street lighting. When these points are considered, together with the cost of lamp renewals, and the eye protection devices that should be adopted [see one of the paragraphs noticing Mr. Ram's reports in last week's "Memoranda"], it will be seen that light for light in over-all costs gas has a good competitive power against these lamps.

Electrical Publicity.

An interesting article appears in "Electrical Industries" on the subject of "Methods in Electrical Publicity." Its chief object is to warn electricity undertakings that while it is the province of the Electricity Development Association to engineer general publicity, it is the work of the central station to supplement it with local work of a character suitable to the conditions of the people living in the area. The advice is sound, and will not be disputed by men of experience. There are, however, in the article a few incidental points which confirm the view that the Electrical Development Association has not yet secured the complete support of the electricity industry. The manufacturing side appears to be most sympathetic, and strongest in support. As to the supply undertakings, their former attitude was one of passive resistance. It now becomes one of semi-passive acquiescence; and in time, it is hoped, it will rise to active and enthusiastic co-operation all round. This is not saying a great deal; and there is a feeling that as much has been said as can be when we read that "the response which has been given by supply undertakings to the appeal of the Association for funds has been substantial enough to encourage an optimistic view." The writer points out that full success for the movement demands spontaneous aid from all the supply undertakings; but one cannot expect such aid to come quickly from men who have been trained to regard technical perfection in the production of electricity as the summit of their ambition. What some of these men regard as being technical perfection is not disclosed by the efficiency of their stations; and so there must be a very fair number who are not so preoccupied in this direction that they cannot give some attention to the question of general publicity. One thing that the British Commercial Gas Association originally found was that certain undertakings patiently waited before subscribing to ascertain the direct results from the central work done by the aid of other people's subscriptions; but they have since learnt that scientific fertilizing not only increases but maintains the yield of the soil.

Dangers and Accidents.

In last week's issue, we noticed some of the sections of the annual report of the Electrical Inspector (Mr. Ram) under the Factory and Workshops Act. As usual, he also deals with dangers and accidents. The development of the use of electric power is mostly by alternating current, which, from the point of view of shock at low voltage, is very much more dangerous if proper care is not taken. In some new works using alternating current, he has seen nothing of which to complain; but, on the other hand, he has found some installations dangerous and defective. Notwithstanding the great increase in the use of electrical energy during the period under review, the total number of electrical accidents has not increased; but the number of fatal ones has. Some 99 fatalities have been reported in the four years, as against 70 in the previous like period of 1911-14. Of course, this only includes the fatalities coming within the range of Mr. Ram's official survey. Of the 99, fourteen occurred in electrical stations of public supply or traction undertakings—the remainder on ordinary factory premises. In addition to these, four fatalities were indirectly caused by electricity—one through the explosion of gas from a secondary battery by an electric spark; another through the failure of the current to a crane; the third was from burns through a girl having her dress set on fire by knocking the lead out of the terminal of a motor; and the fourth from burns through a man short-circuiting conductors with a benzine blow-lamp. It is noted that the pressure of the system in 67 of the 99 fatalities ran from 105 to 440 volts, and the probable voltage of shock from 105 to 250. In one case, the measured pressure was as low as 65. Some 95 out of the 99 fatalities occurred with alternating current—nineteen being on systems of less than 250 volts, while 47 occurred on three-phase systems from 346 to 440 volts. At the end of the report, the importance of artificial respiration in electrical accidents is emphasized as a means of resuscitation. In cases of apparent death from electric shock, artificial respiration should be persevered with for at least two hours, or until the patient revives. In many cases, only a few minutes may be required. Among the non-fatal accidents for the period for which particulars are available, Mr. Ram says, of three cases where the victims were insensible, they were brought round by artificial respiration.

Electricity Supply to Artizans' Dwellings.

Mr. James Cleary, of Brighton, has another article on this subject in the "Electrician." We see that it was as far back as Sept. 2 that our last comments appeared on his efforts to swell the mass of material dealing with the use of electricity in artizan dwellings; and the further article is published on Oct. 10. In this our former comment is only incidentally referred to; but if Mr. Cleary will seriously address himself to the arguments and criticisms advanced by us, instead of trying to be funny, there may be something worth discussing in what he says. There is no doubt that the use of gas for heating and cooking in Brighton has helped to maintain a cleaner atmosphere.

Reminders for Company Secretaries.—The fourth edition has just been issued of "Reminders for Company Secretaries," by Herbert W. Jordan. These "Reminders" have been compiled with a view to affording assistance to secretaries of limited companies who may be in doubt as to the precise statutory obligations and other provisions which they should bear in mind. The book occupies small space, but contains quite a lot of useful information—including an explanation of the various documents which have to be filed on the incorporation of public and private companies, and a table of the duties and fees payable. The publishers are Messrs. Jordan and Sons, Ltd., of Nos. 116 & 117, Chancery Lane, W.C.; and the price is 11d., post free.

The Great Naval Mystery.—Various references have appeared in the Press to so-called "Mystery Ships" which are at present under erection at Southwick, near Brighton; and different theories have been advanced as to the precise purpose they are intended to serve. That they are huge steel and concrete structures is shown by a photograph of one of them taken at close quarters; but otherwise the picture offers little enlightment. It is, however, of interest to note that the whole of the upper portion (which is of steel construction, and no doubt very much more complicated than appears from the purely external view before us) has been made by the Whessoe Foundry Company, Ltd., in their works at Darlington. Originally a number of these structures were on order with different engineering firms. Only two are now being erected; and to the Whessoe Company fell the distinction of completing the first of the steel "tanks" ready for erection on a site.

A Comparison of Beehive and Bye-Product Coke-Ovens.—Dealing with the "Coal Resources of Canada," Mr. F. E. Lucas makes a comparison between beehive and bye-product ovens from tests actually made on Nova Scotia coal. Ordinary beehive ovens 12½ ft. diameter produce 4 net tons (2000 lbs.) of coke in 48 hours. The yield of coke from the coal is 60 p.ct., and there are no bye-products and surplus gas. With a bye-product oven, the charge is 11 net tons, and the coking time about sixteen hours. The coke produced is 71 p.ct., or 11·7 tons per day of 24 hours. The bye-products are: Ammonium sulphate, 27 lbs. per ton, or equal to 38 lbs. per net ton of coke. Tar, 9 gallons per ton of coal; 12·7 gallons per ton of coke. Surplus gas, 6000 c.ft. per ton of coal, equal to 81,450 c.ft. per ton of coke. Motor fuel, 2¼ gallons per ton of coal, equal to 3·17 gallons per ton of coke. The total value of bye-products per ton of coke is $4.31. Add to this the difference between 60 p.ct. yield in beehive ovens and 71 p.ct. in bye-product ovens on the same coal, taking coal at $2 at the ovens: Coal per ton of coke in beehive oven, $3.32; in bye-product oven, $2.80. Balance in favour of bye-product oven, $0.52. Total saving per ton, $4.83, resulting in $56.51 per oven in 24 hours, which, according to pre-war prices, would pay for the building of the bye-product oven.

AN AVAILABLE ECONOMY.

By Arthur Valon, M.Inst.C.E.

It is something of a rarity in these days to find any item in the expenditure of a gas undertaking which does not show a disconcerting tendency to rise like a balloon without ballast. It is still rarer to find any expenditure which, by taking thought, may be reduced. And it is almost as unusual to find a company that has not lost heart for minor economies in face of the paralyzing effect of the Temporary Increase of Charges Act.

For those, however, who are interested in savings which may be material without running into pence per 1000 c.ft., it may be worth while to consider the effect of present conditions on rateable value. In one case, within my own knowledge, a reduction in rateable value has resulted in lessening the expenditure on rates by 1¼d. per 1000 c.ft., and in another instance by ¾d. per 1000 c.ft. These economies are still well worth making in any size undertaking; while in large works a much smaller amount per 1000 c.ft. will represent a good round sum per annum.

It used to be looked upon as a kind of general principle that the higher the price of gas the higher proportionately would be the rateable value. And, no doubt, the persistence of this idea has led many people (in view of rising prices), to be satisfied if the authorities refrained from increasing their assessments.

This idea, however, was never more than approximately correct, as between similarly situated undertakings; and only then because difference in price was usually due more to difference in capital charges than to anything else. As, other things being equal, rateable value depends on the margin of receipts over expenditure, and this in turn depends on the capital charges, it can easily be seen how the idea arose of higher prices involving higher rateable value.

The landslide in economic conditions following on the war has, as we are all only too well aware, raised prices while reducing the margin between receipts and expenditure—the consequence being to reduce rateable value.

But this is not the whole story by any means. The balance left, after deducting expenditure from receipts, leaves an amount which has to cover both the remuneration of the tenant and the landlord's rent. The tenant's share comes first, as no one would take the tenancy unless he could see a sufficient return for his time, his capital, and his responsibility. No one is likely to suggest that the responsibility of running a gas undertaking, or the time requisite, has been lessened by recent happenings, while the capital necessary has been enormously increased by the rise in prices.

Look at the present level of working expenses, as compared with 1914, and the first cost of meters, pipes, and fittings; and then consider the effect of this on the tenant's capital!

So that, while the amount that has to provide both tenant's remuneration and rent has decreased, the tenant's share has largely increased; the result being a striking reduction in rent, and consequently also in rateable value.

A CONDENSED CHEMICAL DICTIONARY.*

There has been received from the Chemical 'Catalog' Company, of New York, a reference volume, compiled and edited by their staff, "for all requiring quick access to a large amount of essential data regarding chemicals, and other substances used in manufacturing and laboratory work." It was realized that the increasing importance of the chemical industries has brought into business contact with them a large number of people not educated along chemical lines; and a thorough search of chemical literature revealing no single publication that they deemed likely to meet exactly the requirements of these people, the publishers determined to produce the present volume, upon which their Editorial Staff have been actively engaged since the early part of last year. During this time the Technical Editor (Mr. F. M. Turner, Jun.), and his three Assistant Editors have, with generous assistance which is readily acknowledged by them, got together a large amount of information, though no attempt has been made to produce an exhaustive work.

The chemical dictionary proper occupies some five hundred pages; and it has been carefully cross-indexed, as a further help towards the ready location of items sought. This cross-indexing even extends to spelling, in cases where some form of spelling is in use that differs materially from the American Chemical Society standard, which has been adopted for the book; and important trade and proprietary names have also been included. By way of provision for memoranda, space is left after each item for a line or so of writing; and to accommodate more extended notes there is a wide margin at the bottom of every page.

In addition to properties and uses, it was thought advisable to insert brief accounts as to how things are made, when they are not natural products. But these notes have been restricted to giving merely a general idea of the process, and are not intended to instruct anyone in the manufacture of the substances. The properties described have been confined to those likely to be of commercial importance. The dictionary portion of the volume is followed by some useful tables and definitions of units. Altogether it is such a book as many people at different times must feel the need of.

* "The Condensed Chemical Dictionary." First edition, 1919. The Chemical 'Catalog' Company, Inc., No. 1, Madison Avenue, New York.

GAS AND OIL ENGINES.

Many persons who have to do with internal combustion engines, and who have not had the advantage of a previous technica training, will welcome a small book, published at a popular price, from which they can derive instruction; and young engineers and students possessing some knowledge of the theory of these engines, will doubtless find useful the practical information on the subject that it offers. These are the aims of the author of such a book,* which has been compiled from a series of articles (revised and re-arranged) that appeared in "Gas and Oil Power." At no time has this particular branch of engineering been of more importance than it is at present, and never, therefore, could the appearance of a work of this character have been more opportune.

All kinds of internal combustion engines are dealt with in the couple of hundred pages of which the book consists; and there are a large number of illustrations—several being of engines installed in the engineering laboratories of the University of Liverpool. The first two chapters deal respectively with heat and work and with the operation of a modern gas-engine; and then there is explained the working of a gas-producer and engine—a description being given of a "Mond" non-recovery gas-producer plant. Hot-tube and electric ignition systems; fuel oils; lubricants and lubrication; and testing and overhauling gas and oil engines—these form the subjects of other chapters. Explanations of the operation of petrol and oil engines make up the remainder of the book, which is written in plain style and simple language—a point of the first importance to the class of readers to whom it is more particularly intended to appeal.

* "Gas and Oil Engine Operation." By J. Okill, M.I.A.E., Assistant Lecturer and Demonstrator in Engineering at the University of Liverpool. London: Sir Isaac Pitman & Sons, Ltd. Price, 5s. net.

AN ADVANCE IN GAS-FIRE CONSTRUCTION.

By "Lemaro."

During the last decade great improvements have been made in the design and construction of gas-fires; and the industry at the present time is rightly advocating their use, to the exclusion of the burning of crude coal in open fire-grates. There can be little doubt that in the near future, owing to the necessity of the conservation of our coal resources, still greater attention will be directed to the use of gas fuel. The efficiency of gas-fires has had the closest attention of manufacturers for many years; and so far as radiant efficiency is concerned, a very advanced stage of perfection has been attained.

Notwithstanding the remarkable strides which have been made in gas-fire construction, the question which the gas industry has now to consider (especially in view of the anticipated use of gas-fires to a large extent in the new houses) is whether the present type of radiant fire, which is almost universally made by manufacturers in this country, is the type which can be claimed to be ideal. Although gas-fires have been very largely adopted by the British public as a means of heating, there have nevertheless been complaints, and repetition of complaints, in connection with them. These are not confined to any one undertaking, but are found to be the universal experience of gas salesmen. For instance, very few salesmen are not familiar with the criticisms of gas-fire users who, while greatly appreciating their many conveniences, often say that, while there may be an almost uncomfortably warm sensation of the body nearest the fire, the other side is often cold. Another form of complaint is that a draughty feeling is often present in a gas-fire warmed room. Another consumer will state that all heat is felt in one direction only, and that the corners of the room are not warm. All these complaints are traceable to the fact that the air of the room generally is not being warmed quickly and uniformly.

Much study and thought have been given by the patentees of the new fire described herein as to the manner in which these complaints may be obviated; and it has appeared to them that the fundamental principle that the room cannot be warmed successfully until the air in it has been raised to the required temperature has not been sufficiently borne in mind by designers and manufacturers. The fire which has been placed before the public during the past years has depended almost exclusively upon its radiating effect to warm the objects in the room, and for the warmth to be then transferred to the air of the room. In the new fire, an effort has been made to retain this maximum quantity of radiant heat, and at the same time to supplement this heat with a large proportion of warm air. This object has been achieved by the construction of a patent air-heating chamber placed immediately behind the fuel radiants, through which air is drawn from the room from a level slightly above the floor, and again discharged into the room through suitably designed outlets.

The patentees are perfectly aware that the combination of

radiant heat and convected heat has been attempted in former types of gas-fires. Without troubling readers with a historical survey of progress in gas-fire construction, it would be as well to consider briefly some of the reasons which led to the abandonment of the old-fashioned convecting or "regenerative" type of gas-fire. These disadvantages may be thus briefly summed up:

The burner gave rise to many complaints owing to its design.

Imperfect combustion resulted owing to the relation of the fuel to the flame.

The flue outlet area was inadequate both to properly carry away products and to allow sufficient air change in the room to take place.

The construction of the flue passages in the stove, together with the faulty canopy design, allowed products of combustion to escape into the room.

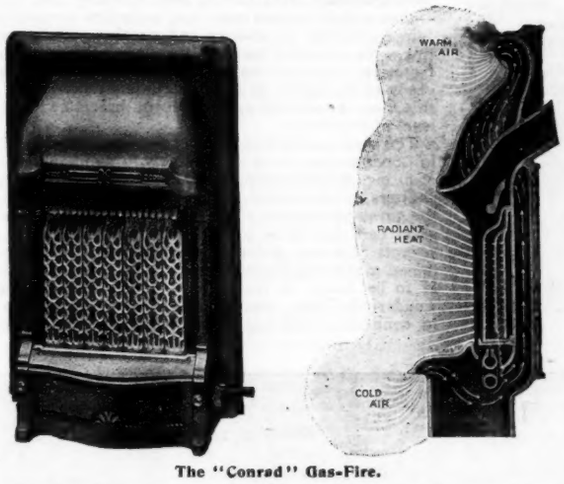
The canopy design allowed foreign matter—such as dust, cigarette ends, matches, &c.—to be deposited on the top of the heated chamber, which gave rise to unpleasant smells and a contaminated atmosphere.

So far as concerns the convection effects, these objectionable features have been eliminated by:

1.—Entirely closing-in the base of the fire, so that no dust or foreign matter can find its way behind the fender.

2.—Arranging the air inlet ports above the floor level, so that only clean air can be drawn into the heating chamber.

3.—By designing a canopy and warm air outlet so that no foreign matter can be introduced into the air-heating chamber, or dust collect on the canopy.



The "Conrad" Gas-Fire.

At the same time the recognized merits of the latest type of radiating fires have been retained, such as:

1.—Silent and adjustable burner.

2.—High efficiency columnar fuel.

3.—Efficient canopy design.

4.—Large flue area sufficient to assist ventilation and carry off products.

In addition to the above, the usual large fire-brick at the back of the radiants, which has been universally used in British gas-fire practice and which proves a costly item of maintenance, has been replaced by a cast-iron plate which is indestructible.

The flame contact with this cast-iron back is prevented by:

(*a*) The use of a special form of columnar radiant.

(*b*) For gas undertakings who require to use a standard fuel, a refractory upright slipper fixed at the back of the standard radiant. A small fire-brick apron is placed immediately above the radiants, covering the top of the cast-iron back plate, and acting also as a clip to the top of the radiants, and dispensing with the usual fuel bar. The general appearance therefore of the radiating portion of the fire is enhanced.

Further advantages are:

(*c*) The fire can be turned-down low when the full radiating effect is not required, and still be relied upon to convey into the room a steady continuous stream of warm air. This alone is a distinct advance on the present form of fire, where efficiency falls to practically zero when the flame no longer maintains the fuel in an incandescent state.

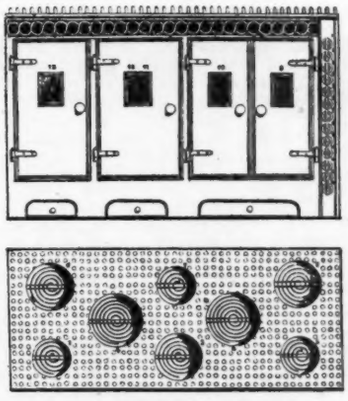
(*d*) Air movement in the room, which is insisted upon as necessary to maintain healthful conditions by all authorities on ventilation, is considerably assisted.

From official tests made on this fire by Dr. E. W. Smith, F.I.C., the Chief Chemist to the Birmingham Corporation Gas Department, it was shown that the "Conrad" fire gave 20 p.ct. more heat into the room, with a consequent more rapid rise in temperature, than with the same size gas-fire not constructed on the new principle, but tested under similar conditions. There was no appreciable difference in the variation of humidities during the tests with either fire.

The "Conrad" fire as illustrated, constructed on the new convection-radiant principle, is manufactured and has now been placed on the market by the Parkinson Stove Company, Ltd., of Stechford, Birmingham. It is anticipated that other well-known makers will shortly be in a position to offer fires to their customers constructed on the same lines.

KING'S GAS COOKING-RANGE.

THERE has recently come into our possession the accompanying illustration, taken from the "Illustrated London News" dated June 14, 1851, of the gas cooking-range designed by the late Mr. Alfred King (at that time Chief Engineer of the Liverpool Gas Company), and shown by Mr. Strode at the great Hyde Park International Exhibition.



Front Elevation and Top Plate of King's Gas-Cooking Range.

The following details of the stove appeared with the illustration: It is divided into three compartments of different sizes for roasting and baking, being furnished with a damper to regulate the flow of air through them. The burner is arranged inside the oven, at the bottom, around the sides, back, and front, with a dripping-pan occupying the centre. The meat is hooked on to a sliding frame or carriage, which, when pushed in, allows it to be suspended surrounded by the gas. On the top of the range are eight spiral burners, in round well-holes, for boiling, stewing, frying &c., any, of which operations can be done with the same facility as on a hot-plate or over a charcoal fire. The meat roasted by this range, owing to the regularity and certainty of the operation, is of a more nutritive character than that cooked by the ordinary process, as more of the juices of the meat are retained, which is ascertained by the comparatively small loss of weight after cooking. By the operation of broiling, twelve chops can be cooked at once, at a cost of not more than 2d. per hour for gas, which gives at the rate of sixty chops at an outlay of only 2d. for gas. Comfort and cleanliness to the cook, and economy to the consumer, are among the qualifications of this useful invention. The gas is lighted with a gas-torch, or portable jet of iron pipe, attached to a flexible pipe.

Few Accidents on Gas Plants.

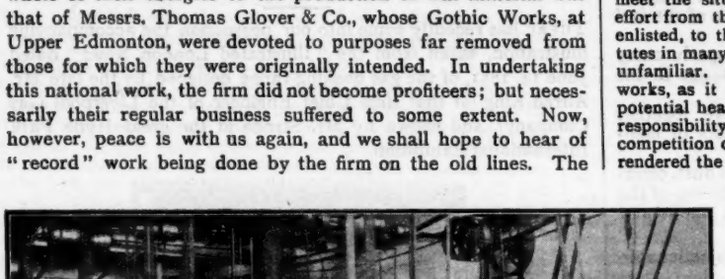
Alluding to the subject of accidents in connection with gas plants, Mr. L. G. Adams, the Gas Engineer for the Illinois Northern Utilities Company, declares, according to the "American Gas Engineering Journal," that they are few in comparison with those in other manufacturing establishments involving anything like the same risk. This is due, in his opinion, to the sturdy construction of gas plants, and to careful inspection throughout the 24 hours of operation. A plant which runs successfully and efficiently must have this careful and regular inspection, as any neglect almost immediately results in stoppages, irregular operating results, and apparatus being put out of commission. This condition is at once apparent to the management; and it follows that superintendents, foremen, and other operatives anticipate such troubles, and watch the plant for defects and conditions that would cause accidents, interrupt the continuity of operations, or make the work more difficult. A succession of minor accidents to employees is a sure sign to the management of waning care and watchfulness, and this is a very strong argument in favour of the practice of ascertaining the cause of all personal injuries, however small, so that the management may detect and correct conditions which might lead to more serious injuries. The great number of changes in personnel during the last two years have had the inevitable effect of lowering the percentage of experienced and tried men in the works; and the need is correspondingly greater for inspection, conferences, and counsel by foremen, superintendents, and executives. One point which Mr. Adams makes is that no man should be permitted to go into a dangerous gaseous atmosphere without attendance.

The Blackburn Corporation are advertising for a Gas Engineer and Manager to succeed Mr. J. W. M'Lusky. The salary offered is £900 a year, or £100 more than has been paid to the present Engineer.

WAR ACTIVITIES AT EDMONTON.

Work that was Done by Messrs. Thomas Glover & Co.

Among the firms who, when the first and foremost need of the country was munitions for the armies in the field, turned the whole of their energies to the production of war material was that of Messrs. Thomas Glover & Co., whose Gothic Works, at Upper Edmonton, were devoted to purposes far removed from those for which they were originally intended. In undertaking this national work, the firm did not become profiteers; but necessarily their regular business suffered to some extent. Now, however, peace is with us again, and we shall hope to hear of "record" work being done by the firm on the old lines. The following notes of the firm's war activities will doubtless prove of interest to readers.



MAKING EIGHTEEN-POUNDER GUN PARTS.

The Pre-War Position.

Before setting out on the narrative of Messrs. Thomas Glover & Co.'s part in the war, it may be convenient to glance at the firm's pre-war position. The pioneer concern was founded some three-quarters-of-a-century ago, for the manufacture and supply of gas-meters, and had maintained a progressive production that kept it in a foremost place in the trade.

The phase of the evolution of the gas industry that inaugurated a great development in the application of gas to domestic purposes other than lighting, marked an important development in the firm's activities. Messrs. R. & A. Main had also set out to meet this demand; and a large and growing business was the result. The two firms amalgamated; and a branch of R. & A. Main was established at Edmonton, and is now under the same management.

The peaceful years of this century preceding the emergency forced upon the country by the war, were remarkable for the rapid increase in the firm's output following the introduction of many new features and improvements in gas appliances. Some of these were of a novel character—the outcome of research and experimental work in the firm's laboratory, combined with many years of practical manufacturing experience. Extensive additions were made to the new factory at Edmonton, and record orders were handled for both ordinary and prepayment dry gas-meters, gas cooking and heating apparatus, gas-lamps, high-pressure lighting installations, &c.

Outbreak of War.

When war was declared, there was an immediate recognition of the claims of the men who enlisted; and they received the assurance that their situations would all be kept open, even if their re-employment necessitated them receiving preferential treatment.

Several large war contracts had already been successfully completed, when, owing to the exigencies of the military situation, the Government decided to acquire the control of such factories as were considered suitable for the manufacture of munitions of war. When faced with this probability, no doubt many concerns regarded the matter from the point of view of financial expediency, and placed considerations of their own immediate interest before the national welfare. That they made no attempt to avoid control and pursue more permanent and profitable business, is a source of satisfaction to the Directors of Messrs. Glover & Co., even though this meant that their legitimate business suffered restriction. No excess profits have been made by the firm.

Every endeavour was put forth to meet the requirements of their clients, and advantage was taken of any lull in war demands to manufacture or repair gas-meters and gas cooking and heating appliances when material was available. It often happened, however, that even this effort was diverted; the authorities requisitioning the goods for hospitals, convalescent homes, canteens, barracks, munition centres, and national kitchens.

There was a necessary adjustment of the various departments to meet the situation caused by the diversion of the firm's productive effort from their normal trade to munition making. The men who enlisted, to the number of 350, had to be replaced; and the substitutes in many cases had to be trained for work with which they were unfamiliar. Female labour had not previously been utilized at the works, as it was considered that the male adult, as the actual or potential head of the nationally important family unit, had the greatest responsibility, and that he should not therefore be handicapped by the competition of what was cheaper labour. When the man-power crisis rendered the introduction of female labour inevitable, the firm made arrangements for the necessary dilution.

Tribute should be paid to the achievements of the workers. They laboured long hours, and at critical periods did not know the leisure of week-ends or bank holidays. The preservation of the *morale* of the workers—especially in an air-raid area—is one very gratifying feature of the war.

Mess Tins and Aeroplane Fittings.

One of the first large war orders carried out by the firm was for Serbian army pattern mess tins. These provide a striking contrast to the British pattern mess tin—being very much larger, and of a peculiar shape. Made of black iron, the mess tins were tinned in the works, tinning plant having been specially laid down—thus adding yet one more item to the firm's resources. Large numbers of infantry and cavalry pattern mess tins were supplied for our own army. The manufacture of water-bottles was also undertaken, and hundreds of thousands of these were duly delivered. In this case, the enamelling department maintained a high level of excellence.

The sheet metal shop—one of the biggest of its kind in London—was given over largely to the manufacture of fittings for our aeroplanes. Radiators, petrol tanks, shutters, wind screens, and cowls or bonnets formed the principal items in the output. As will be realized, great care has to be exercised in the manufacture of aircraft fitments; and their lightness must not be obtained at the sacrifice of strength. An instance of this Is to be found in the radiator tube, which, though wonderfully light, stands a test by hydraulic pressure. in connection with this class of work, it is interesting to note that the famous Handley-Page bombing machine comprised fitments made at the factory, as did the D.H.4 type of plane, the first specimen of which was actually fitted on the spot.

MILLING EIGHTEEN-POUNDER GUN CARRIERS AND EXTRACTORS.

Before turning from this branch of war work, it should be remarked that the firm supplied piping and connections for use in inflating airships, and were also entrusted with the manufacture of the "Spirometer," a medical instrument for testing the soundness and capacity of airmen's lungs.

Heating Stoves and Gun Parts.

One product for which the factory's normal equipment was conveniently adapted are the trench heating stoves supplied for the Canadian army. These stoves are made of sheet iron, and are somewhat on the principle of the slow-combustion stove.

The magnitude of the artillery arm of the service was reflected in the output and expansion of the engineering shop. This department was constantly employed on breech-locks, and, indeed, on all parts of breech mechanism—strikers, triggers, extractors, &c. In addition,

there was a constant flow of gun parts for repair—howitzer, 13 and 18 pounder, 3 in., 4·5 in., 6 in., and 9·2 in. components were all dealt with. Various rifle parts—such as magazines, piling swivels, and sight protectors—were manufactured in large quantities.

Super-Tank Gears.

In view of the recent disclosures regarding the capabilities of our new super-tanks, it may now be stated that the gears which play such an important part in rendering them so extremely mobile were made in the firm's engineering shop. Needless to say, mechanism such as this demands the utmost care and accuracy in manufacture and in selection of material, and a high degree of technical knowledge.

Millions of Grenades.

The iron foundry and fitting shop were maintained at high pressure. Millions of grenades were manufactured. The initial order for this type of weapon was for the French army; and subsequently regular orders were completed for Pippin, Mills, and W.P. grenades. Daylight signal grenades and flares, for use in conjunction with our aerial force, swelled the volume of this class of work. Shell parts for the Stokes gun were a feature of the daily output of the foundry; and the shells were completed, with the exception of filling with explosive, in the engineering shop.

All the necessary tools and gauges for the manufacture of the munitions supplied by the firm were made in their own shops. Gauges for big gun mechanism were also supplied to other manufacturers. A considerable amount of experimental work was carried out on behalf of the Trench Warfare Department, and notably in connection with the W.P. grenade.

Evidence of the intensive anti-submarine campaign is found in the Admiralty's commission to manufacture depth-charge cylinders, and the necessary detonators and detonator boxes.

Contributions to the field-cookery equipment of the army were made in the form of Aldershot ovens, Soyers' stoves, camp kettles or dixies, and meat tins. These and other auxiliaries of field cookery were produced in large numbers. Convenient portable medicine chests were manufactured for the medical service. Fuses of various types and picric acid containers, manufactured in copper and heavily tinned, bring the enumeration of the principal items of Messrs. Glover & Co.'s war work to a close.

There are various other articles of less importance which could be added to the list; but sufficient has been said to show that the firm's manufactures played a part in all theatres of war—air, land, and sea. Their other factories at Birmingham and Falkirk also made similar large quantities of war material, which, as in the case of the Edmonton factory, meant that financial expediency and the pursuit of more profitable business were ignored.

Not directly connected with the war, but of interest in view of the coal crisis, is the apparatus for the rapid drying of peat made at the request of the Government.

Peace Again.

To meet the urgent requirements of the Ministry of Munitions, considerable additions had to be made to plant and machinery; and the return of peace finds the factory better equipped than ever in this respect. Practically every process in the manufacture of gas-meters and gas cooking and heating appliances can be completely carried out on the premises.

The majority of the men who joined the colours are returning to their old situations as they are demobilized. They earned their share of honours; and it is a pleasure to note that up to the present one V.C., one C.M.G., one D.S.O., one D.C.M., and five M.M.'s are included in those who have returned to civil employment at the works. Forty-eight made the great sacrifice. To perpetuate their memory, a memorial scheme is under consideration. An eminently practical proposal has been put forward, to provide a fund for the higher education and apprenticeship of their orphans; and there will of course be a tablet suitably inscribed with the names of the heroic confraternity.

Conditions are still abnormal; and the difficulties incidental to the re-transfer of effort are many. These difficulties are being steadily overcome; and it is hoped that the near future will find the firm free from all official restriction, and in a position to devote themselves once more exclusively and successfully to their clients' interests.

Workers' Welfare.

For those who are interested in the welfare and recreation of the worker, the following notes are added.

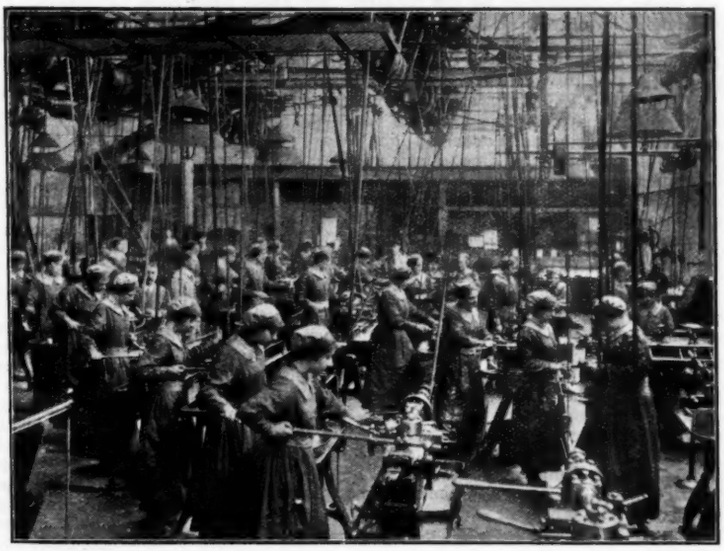
Before the war, a commodious dining-hall and canteen had been provided for the men's exclusive use. Attached to these is an up-to-date kitchen equipped throughout with gas-cooking appliances manufactured and supplied by the firm. The catering and management are entirely in the hands of the men. New and separate dining rooms have since been provided for the use of the works and office female personnel. The Gothic Horticultural Society has been in existence for many years; and its members cultivate a large tract of land, the property of the firm, near the works. Besides contributing to the amelioration of the food difficulty, these allotment holders received the benefit of a healthy open-air hobby. As the outcome of the food problem, the Gothic Pig and Poultry Society was formed; the firm providing the necessary capital, ground, and buildings. This remains a thriving institution.

The men on active service were never forgotten. The Gothic Parcels Fund was founded immediately after the outbreak of hostilities. The fund was supported by weekly contributions, which with the proceeds of various concerts held in the men's dining-hall, enabled an enthusiastic Committee to carry on most successfully. Upwards of 6400 parcels were sent "out there." These often arrived at very opportune moments, and were greatly appreciated. A complete company of Special Constabulary was recruited from the works. To the Gothic Works Specials fell the duty of guarding the water-works and railway and canal bridges in the neighbourhood. Perhaps the most important feature of their service was in connection with air-raids. Their duties lay in the track of the raiders, and frequently after a hard day's work in the factory they had to stay out till the small hours of the morning shepherding the populace. As an illustration of these harassing times, it may be stated that they were on duty on 54 of the air-raid nights.

Attached to the Specials was a fully equipped motor ambulance, ready to turn out at any time; the personnel, male and female, being recruited at the works. A motor lorry was also kept in constant readiness, loaded with the tackle necessary for rescue work at premises damaged by bombs. Periodical first-aid classes are still held, and are open to, and attended by, workers from neighbouring factories.

Arising out of the urgent need for relaxation, a military band came into existence. The performers are all employed at the works; and evidence of their talent and success is to be found in their engagements to play in the public parks in the neighbourhood.

The financial side of the war was not forgotten; and a scheme was instituted whereby employees were enabled to purchase War Savings Certificates from the firm on the instalment system. As the result of a special war loan week in 1917, over £15,000 was subscribed.



Safety, Health, and Welfare in Factories.

The recently issued annual report of the Chief Inspector of Factories and Workshops (Mr. H. M. Robinson) contains a good deal of valuable matter, set forth in a series of chapters by different authors—two of which have already received notice in the pages of the "Journal." The matters dealt with in these chapters include hours of work, accident prevention, labour-saving appliances, and welfare. In fact, the prominence given to safety, health, and welfare, including reduction in the hours of labour, has perhaps been the principal feature of the work of the Department, not only during the past year, but also during the whole period of the war; and it is remarked that the experience gained had great effect on the conditions of industrial employment. It has shown that an increase in the ordinary hours of work does not necessarily mean increased production; that the more the comfort and welfare of the worker are studied and provided for, the greater his output; and that attention given to health and the prevention of accidents means greater efficiency and reduced charges. The results will, the Chief Inspector goes on to point out, to a large extent be permanent; and further improvement will be assisted by the powers which enable the Secretary of State to make Orders requiring special welfare provision wherever necessary; by the establishment of National Industrial Councils representative of employers and employed; and by the appreciation large numbers of employers have already shown of the benefits of improved conditions.

Institution of Civil Engineers' Abstracts.—It has been decided by the Council of the Institution of Civil Engineers to issue in pamphlet form (as a publication distinct from the "Minutes of Proceedings," instead of, as they have been printed since 1875, a section of the proceedings) their "Abstracts of Papers in Scientific Transactions and Periodicals;" and there has been received a copy of the first number of this new series, edited by Dr. J. H. T. Tudsbery, the Secretary of the Institution. It is to be a quarterly publication, with name and subject indexes, which will be printed also in the "Minutes of Proceedings." The new arrangement is one which will doubtless meet with general approval; for, as is pointed out, it will render the abstracts available more promptly and regularly than was practicable under the old conditions.

NORTH OF ENGLAND GAS MANAGERS' ASSOCIATION.

Autumn Meeting at York.

The Autumn Meeting of the North of England Gas Managers' Association was held at the Royal Station Hotel, York, last Saturday. Mr. Harold E. Bloor (the President) occupied the chair.

New Members.

The following new members were elected: Mr. Robert Thos. Rycroft, of Tadcaster; Mr. James R. Kidd, of Middleton St. George; Mr. F. J. Bywater, of Newcastle-on-Tyne; and Mr. Ernest Sainter, of Houghton-le-Spring.

Amendment of Rule 5.

The Hon. Secretary (Mr. Herbert Lees) moved that Rule 5 should be amended so as to allow of six members being elected to the Committee (in place of four, as at present) for two years, three of whom shall retire each year by rotation.

The motion was seconded and unanimously carried.

The President then delivered the following

PRESIDENTIAL ADDRESS.

Gentlemen,—The honour which you have done me in electing me your President is one which I greatly appreciate, though to some extent the pleasure of occupying such an exalted position is marred by the necessity of presenting an address to you to-day. It is true that the state of the gas industry at the present time provides an unprecedented number of important subjects which are under consideration by the industry; but these have been thoroughly discussed in many excellent presidential addresses during the past year or two, and have been constantly referred to in our Technical Press. I must, however, hope that the field is so large that there is still room for cultivation.

It is my privilege to address you at your first meeting since the declaration of peace. The advent of peace—so anxiously looked forward to—has actually occurred; and we are now enjoying life in that blessed period of time to which we so often referred while hostilities were in progress—"After the war." It is true that a dozen or so wars are in progress or in contemplation in various quarters of the globe; but "The War" is over, and no longer do we hear the sound of the Zeppelin over the land, while we almost miss the thrill of the searchlights making their nightly practice illumination.

We have, in fact, "muddled through" again to victory. Victory almost appears to be a prescriptive right of our race; for if a miracle is required to save us, it duly happens. And it needed a veritable miracle to save us this time.

Having won the war, we are now looking out for the "New Heaven" and the "New Earth" so often promised us, and now demanded as a right by large sections of our population, and as we look we shall find a veritable new earth—a topsy-turvy one. The old heresy that industry and thrift are cardinal virtues has at length been found out. No longer need our fathers tell us, "There is plenty of room at the top," and suchlike flapdoodle. No! It is at the bottom where there is room and to spare; and we may stay at the bottom and put in our claim for all that life can offer.

Broadly speaking, there are no poor now except the poor rich of old times—professional men and the brain workers on whom industry depends; and everybody is taking life easily and producing as little as possible, and wondering why on earth things are dear even when procurable. The most optimistic among us must feel that things look bad just now; but we must be thankful that in these isles things are seldom as bad as they seem, and that our history gives us the assurance that we shall ultimately prove worthy of our birthright, and from the present chaos evolve a better and even more glorious England.

RETROSPECT.

My first thought in commencing to write this address was that you have happily made me your President in the year in which I arrive at my majority as a gas engineer; and I remember that, when the decision that I should be trained to follow our profession was made, some of my father's friends remarked to him that it was a mistake, because in twenty years there would be no gas. He, however, had a different opinion, which experience has confirmed. Electricity was at that time very much in the air; and, by a coincidence, we have reached a similar situation in this present year of grace.

In order to bring the matter to the test of figures, I have consulted the Board of Trade returns relating to authorized gas undertakings, company and municipal, and the tables which follow may be of some interest. The statistics began with the year 1882; and as that year also happened to have rather a special interest for me, I give the figures for the three years 1882, 1898, 1913 (the last year available).

Number of Authorized Undertakings.

	1882.	1898.	1913.
Company	352	439	519
Municipal	148	222	312
Total	500	661	831

Capital Subscribed.

Company	£32,934,935	£53,494,781	£95,173,055
Municipal	£17,326,183	£28,614,971	£44,554,222
Total	£50,261,118	£82,109,752	£139,727,277

Total Gas Made in 1000's.

Company	49,360,289	86,705,723	118,951,820
Municipal	23,223,054	51,441,272	82,261,237
Total	72,583,343	138,146,995	201,213,057

Gas Made per Ton of Coal.

Company, c.ft.	10,000	10,250	11,750
Municipal	9,870	10,080	11,220

Number of Consumers.

Company	1,055,009	1,670,847	4,214,865
Municipal	916,962	1,578,291	2,888,248
Total	1,971,971	3,249,138	7,103,113

Consumption per Consumer.

Company, c.ft.	46,800	51,900	28,500
Municipal	25,300	32,600	28,500

The record of progress indicated by these figures is unmistakable; and perhaps the most striking point which they bring out is the immense broadening of the basis of the industry which has followed from the introduction of the slot-meter. No summary of slot consumers is available for 1898; but in 1913 they represented no less than 58·7 p.ct. of the companies' consumers, and 44·9 p.ct. of municipal consumers.

LABOUR.

It is impossible to omit some reference to the labour situation. Having secured peace abroad, we find it succeeded by something very like war at home. True, war is not confined wholly to fighting; for economic pressure has a large part in modern warfare. Such economic pressure has since the armistice been exerted by various sections of the workers against the whole body politic; and the latter has generally lost.

The economic heresies which have been preached incessantly to the workers for a generation, have—by constant repetition, and the entire absence of counter-propaganda—acquired the status of accepted truths, among the whole body of organized workers; and it is difficult to see how the unholy alliance between the spurious altruism of the "ca canny" policy and the instinct of laziness, is now to be successfully attacked, even though its absolute overthrow as a current creed seems essential to the continuance of this country as a prosperous and a leading state. We are rapidly approaching a condition analogous to the gentleman who was "all dressed up and nowhere to go." All our pockets will be full of money, and there will be nothing to buy with it.

Workers in the gas industry have played an honourable part during the war, and since; and this may be attributable to the fact that the entire personnel of the industry is accustomed to the idea of service to the community. Be that as it may, I think testimony should be paid to the loyalty and reasonableness of the employees and staffs of gas undertakings generally in very trying times during and since the war. It is only fair to state that the industry as a whole has deserved the loyal service which has been rendered, by liberal treatment of their workmen, as regards pay, holidays, and general conditions of employment.

The Central and Regional Whitley Councils have now been established, and will soon be getting to work. It is greatly to be hoped that this excellent idea will not break-down owing to the use of these Councils as standing invitations to the representatives of labour to put forward constant demands in the name of their constituents. Perhaps it may usefully be pointed out that we have at present no means of knowing how far demands are the natural outcome of a genuine need or spontaneous desire of the workers as a whole. There is some ground for the fear that demands are sometimes put forward by officials, and afterwards adopted by their members. It is not in reason that any body of men asked, "Would you like so and so?" should be expected to say, "No, we do not." If I am right in this, a good deal of the present industrial unrest is explained; and although there is little hope of such an essentially democratic and proper arrangement being made, it would be better in every way if some system of genuinely secret ballot, worked by disinterested parties, could be made compulsory before any demand could be regarded as the basis of a strike.

Had such a law been in force, the lamentable railway strike we have just experienced would certainly never have occurred. I view the result of this strike with the gravest apprehension. If the State ever carries any difference of opinion with its employees to the length of causing a strike, every ground of public policy demands that the State should be completely victorious. There is no doubt whatever that the railway workers believe that they have won a glorious victory; and it is what they think that matters. It is unnecessary to inquire whether the terms given are right or wrong. In any case the Government would seem to be blameworthy; for in the one case the strike should not have occurred,

and n the other it should have ended differently. It is extremely unfortunate that the real point at issue still remains unsettled.

WAR EXPERIENCES.

Our wartime reconstruction of works having been described in a paper to this Association, I now propose to give a few financial and other figures relating to the war period.

Dividends stood at £4 4s. p.ct. per annum in 1914, or 4s. p.ct. above the standard. In 1915, the dividend was reduced to 4 p.ct., on account of an increase of 2d. per 1000 c.ft., which took effect in the June quarter. In 1916, our price was increased 4d., and the dividend reduced to £3 12s., at which it continued until this year. The price of gas was reduced to 2s. 4d. in January, 1918; but unexpected increases of costs forced two advances in March and June—bringing the price back to 2s. 7d. The present price (from July, 1919) is 3s. 1d., corresponding to a dividend of 3 p.ct. or 75 p.ct. of our standard dividend. It will be noted that our price history during the war is a somewhat remarkable one—more particularly when it is realized that the outbreak of war found us with a completely manually operated carbonizing plant, which has had practically to be rebuilt and equipped with labour-saving machinery.

Special attention may be called to the fact that, although we can claim with some justification (having regard to the ruling value of money) that we have, in effect, reduced the price of our gas, the measure of relief granted by Parliament last year has not been of any assistance to us; and, so far from obtaining the reward to which we feel that we are entitled, we have suffered a loss amounting to 28·5 p.ct. of the pre-war dividend.

The gas consumption has been very well maintained, having regard to the fact that York developed no gas-consuming war industries except of course the large number of military offices, &c. The quarterly consumption since January, 1914, is shown in the following table:

	Gas Accounted-for, 1000's Cubic Feet.					Gas Unaccounted-for.		Total Gas Sent Out.
	Mar. Qr.	June Qr.	Sept. Qr.	Dec. Qr.	Total.	1000's.	P.Ct.	
1914	171,367	107,239	105,564	167,976	552,146	48,639	8·09	600,785
1915	188,831	101,473	114,598	156,979	561,881	50,099	8·18	611,981
1916	168,491	119,274	100,108	141,957	529,830	54,598	9·34	584,428
1917	174,730	118,859	101,665	154,667	549,921	53,388	8·85	603,309
1918	181,829	125,424	114,251	137,666	559,170	44,958	7·44	604,128
1919	177,760	128,676	135,000 (estd.)	..	..	..	..	..

The December quarter of 1918 is specially interesting, as showing the effect of rationing. An increase of 26¼ million cubic feet in the first three quarters of the year is largely neutralized by a sharp decrease of 17 millions in the December quarter. There would undoubtedly have been an increase in the December quarter of 1918 and the January quarter of 1919 had the rationing order not been in force.

Our summer consumption this year—doubtless due to the shortage of coal—has been remarkable. It suggests the possibilities of the field for gas which would reveal themselves if the consumption of raw coal for domestic purposes were ever to be prohibited, as it may be hoped will some day be the case. Consumers have clearly availed themselves of gas as a means of saving coal. The results of a similar turning to gas in midwinter might provide some startling consumption figures, and strain our resources to the utmost—both as to plant and coal. Coal stocks are less than half the quantities available at the beginning of the winter during the war years, and less than was usual in normal pre-war times.

The war experience in the hire and sale of gas appliances is shown by the following tables:

TABLE I.—*Net Gain or Loss of All Appliances.*

—	1914.	1915.	1916.	1917.	1918.
	Net.	Net.	Net.	Net.	Net.
Cookers	+ 284	+ 149	− 1	+ 99	+ 67
Grillers	+ 145	+ 408	+ 201	+ 294	− 11
Water-heaters	+ 220	+ 200	+ 66	+ 75	+ 47
Gas-fires	+ 508	+ 480	+ 222	+ 274	+ 40
Radiators	+ 21	+ 52	− 24	+ 47	+ 13
Net increase	1178	1289	464	789	156

TABLE II.—*Hired Appliances Fixed and Removed; Showing the Large Numbers Handled in Proportion to the Net Gain or Loss.*

—	1914.		1915.		1916.		1917.		1918.	
	Hired	Retd.	Hired	Retd.	Hired	Retd.	Hired	Retd.	Hired	Retd.
Cookers	600	330	399	263	260	280	245	181	157	138
Grillers	174	92	133	91	46	79	56	70	24	47
Water-heaters	177	21	168	43	86	64	86	44	60	30
Gas-fires	411	119	402	177	173	213	164	163	25	132
Radiators	61	58	90	63	24	48	36	28	23	59
Total	1423	620	1192	637	589	684	587	486	289	406
Total handled	2043		1829		1273		1073		695	
Net gain or loss	+ 803		+ 555		− 95		+ 101		− 117	

TABLE III.—*Number of Appliances Sold Outright, and Number Returned—i.e., Purchased Back from the Consumer.*

	1914.		1915.		1916.		1917.		1918.	
	Sold.	Retd.	Sold.	Retd.	Sold.	Retd.	Sold.	Retd.	Sold.	Retd.
Cookers	14	—	13	—	19	—	35	—	48	—
Grillers	63	—	366	—	234	—	308	—	14	2
Water-heaters	64	—	75	—	44	—	34	1	17	—
Gas-fires	216	—	255	—	262	—	273	—	159	12
Radiators	18	—	25	—	—	—	39	—	50	1
Total	375	—	734	—	559	—	689	1	288	15
Total handled	375		734		559		690		303	

A study of these tables throws into strong relief the special value of the outright sales business, as in addition to the fact that the consumers finance the business, there is an almost total absence of returns. It would also appear that a very satisfactory number of appliances can be sold outright as compared with the net gain of hired appliances, in each class excepting cookers. Cookers are evidently too expensive in first cost for the average consumer; but it might prove desirable to sell them outright at a good deal below cost. The saving in handling and repairs would permit of an appreciable discount being given, and there would be a certain but incalculable gain in the proprietary feeling towards the cooker which is so lacking towards hired apparatus.

FUTURE OF THE INDUSTRY.

In proportion as Parliament extends its control of industry and national life, so must it more and more delegate to commissions or committees the decision of scientific, technical, financial, and other matters incapable of settlement by the inexpert. The decisions of committees should, therefore, be carefully scrutinized, and no finding believed to be unsound should be allowed to pass unchallenged. Valuable work is being done by the National Gas Council on these lines, in connection with the Beilby report and the report of the Coal Conservation Sub-Committee on Electric Power Supply. I think too little notice has been taken of the report of the "Committee appointed to Consider Questions of Building Construction in Connection with the Provision of Dwellings for the Working Classes." This Committee in their report strongly advise electric lighting for artizan dwellings, and give their reasons for so doing. They say the people want it. This may be the case; and, if so, it is our business to see about it. When they proceed, however, to object to gas on account of vitiation of the air, their allegation at once makes the choice, gas or electricity, one for the sociologist and the health authorities; and if we pass such an official expression without protest, we may find it quoted against us as an authoritative pronouncement. We are entitled to claim that the history and experience of a century totally disprove the claim that gas lighting is in the smallest degree inimical to health; while it is by no means difficult to find support for the opinion that it has proved to be a definite health agent.

The Committee praise electricity on the ground that it "saves considerable expense in whitewashing ceilings, redecorating walls, &c." Did anybody ever hear of a room being repapered on account of damage by gas lighting? I never did. And what is "&c."? Does not the extension of the "dirty ceilings" complaint in this manner prove (if proof were needed) that this part of the report is pure rhetoric?

Had the Committee investigated the question on sound lines they would have had to credit gas with a substantial saving of fuel. A gas light in a small room makes a lot of difference, and frequently saves a fire; while electrically lighted houses are never so comfortable as gas lighted ones. They would also have discovered that there are sound public health reasons for advocating regular whitening of ceilings, and that permanently "clean" ceilings would not be an unmixed blessing—particularly in small and thickly-populated dwellings. And, most important of all, investigation would have shown that gas lighting aids ventilation, and that a gas light is practically a ventilating engine.

No tittle of statistical or scientific evidence has ever been produced to weaken the force of Dr. Rideal's dictum: "The medical conclusions are in accord with the chemical and physical data, and also demonstrate that the choice between the two systems of lighting does not depend upon hygienic considerations." We have, indeed, had too much of this trotting-out of electricity canvassers' "Talking Points" against gas; and when they are put forward, *en bloc*, by a Committee appointed to guide national policy, it is really time to protest.

I may be wrong, but there seems a section of gas engineers who regard with something like equanimity the possibility that we may lose our lighting load. The doom of gas as an illuminant may be sounded some day, but certainly not yet, unless we lend colour to the idea that the overriding consideration of public health demands it. We have lost more lighting business because of defective gas-burners than for any other reason; and we are still doing it. To stop this tendency the adoption of free maintenance may be necessary; and we shall certainly have to keep more uniform quality and pressure. Possibly, the extraction of cyanogen may have to become a universal practice. Given satisfaction at the burner, our lighting load will be lost very slowly; but, otherwise, the next few years may see a landslide towards electricity which might be prevented, but would be impossible to stop when once started. The lighting load, with its regular seasonal

rise and fall with the lighting hours, plays a part of the utmost importance in our economy, and for obvious reasons can never be replaced in any true sense by the heating load.

PROBLEM OF RENOVATION OF WORKS.

In a paper on the "Wartime Alterations of York Gas-Works" read before the Association in 1917, I remarked on the extreme difficulty of deciding the best method of modernizing gas-works. The difficulties are now almost overwhelming. What with the abnormal cost of all new plant, slowness of completion of work, and uncertainty as to the future national policy in relation to the quality of gas, it would appear that the scales have shifted heavily in the direction of continuing the use of antiquated plant, rather than scrapping and replacing with modern equipment. Probably at no previous time were gas engineers more receptive to the call for increased efficiency; and it will be deplorable if it should prove possible only to respond by improvement in detail when national needs and future security for the industry call for radical alterations of plant and methods.

PRODUCTION AND QUALITY OF COAL.

Vitally interested as we are in the question of coal supply, we are naturally watching the output of coal with anxiety; and when we see the statistics from time to time we may be pardoned if we wonder how much of the alleged coal produced is really coal, for calculated back to the percentage of inerts ruling before the war the output figures would be materially reduced. It would now appear to be in the interests of the miners and their leaders, the colliery proprietors, and all politicans who are involved in any way with the coal question, to swell as much as possible the volume of "coal" raised, and so inflate the statistics. Such a state of affairs bodes ill for users of coal.

If the miners and owners could be paid on the heat units raised, with a crushing penalty for all inerts over 5 p.ct., the statistics might look worse; but the facts would be much better from the country's point of view, and we, especially, should have happier times. Heaven knows where redress is to come from just now; but all talk of increasing national efficiency and the scientific management of our resources, is mere balderdash while the existing scandalous conditions are permitted to go on. Complaints of the abnormal proportion of ash in coal are general; but there are other difficulties, the incidence of which varies widely in different parts of the country. One of these is the fact that we are still unable to buy our coal where we like, and to choose the qualities most suited to us.

There should in no case be any doubt as to our receiving a sufficiency of coal to keep us going. Surely the authorities must know by now that no urban community can suffer desperate privations to-day, so long as the gas undertaking has full holders; while with every cellar in the town full, the whole community is at once in straits if the gas supply fail through shortage of coal.

FINANCIAL HARDSHIPS.

The financial hardships of the gas industry are so evident that it is difficult indeed to believe that any reasonable person can refuse to recognize them. Our industry for many reasons deserves the sympathetic regard of the entire community, and, not least, that of the workers.

Almost all the amenities which raise our life above the standard of primitive man are ascribable to the efforts of exceptional brains and the ranging of capital in search of safe and remunerative investment. Increase of capital is merely the difference between income and expenditure—in other words, savings. The man who might have spent his money saves it. He refuses to realize his cash in kind and to consume the proportion of commodities which his service to the community has conferred upon him the power to consume; and in due course his money builds a dwelling, or helps to start a new industry or enlarge an existing one. All this is very elementary; but it has special significance for us as guardians of the interests of our shareholders, for the reason that our industry is little concerned with so-called "capitalists," and has always appealed mainly to the investor of small means, who prefers a safe local investment for his money. We are inevitably involved in the backwash of opposition to the aggregation of large sums of capital in individual hands; but I refuse to believe that the workers as a class, with a reasonable explanation of the facts before them, would desire to withhold from gas companies a genuine measure of financial relief.

Gas company shareholders do not belong to the class of "capitalists," and for good reasons. A capitalist who investigated our business before the war, with a view to devoting his capital and brains to it, would have found that it offered him only a "gilt-edged security" rate of interest on his money, and practically no hope of serious increase of capital value. If he by the exercise of his (hypothetical) business ability could have seen his way to effect substantial economies, he would have had to give to his consumers, say, six-sevenths of all his savings; whereas in any ordinary business the whole would have been available for himself. In short, he would have found that money invested in gas companies is in essence money out at interest, with in some cases a prospect of a slight increase in the rate of interest. "Profits" as the capitalist knows them, were impossible; and he had, therefore, better uses for his money.

We see ourselves, therefore, to-day as an industry in which a distinct degree of socialism is realized by the limitation of the reward of capital—an industry without the assistance of which the great war would inevitably have been lost, and our country be now wallowing in misery; an industry which represents the conservation of coal to the highest power yet achieved in connection with many domestic and industrial power, light, and heat applications; to which is directly due an incalculable amount of comfort and health and amelioration of the life of the masses during a history of over a hundred years; in which "profiteering" has for at least two generations being impossible; and, at the same time, almost the sole example of any industry in this country unable to pay to the capital employed a return equal in nominal amount to that which by express act and consent of the Government it was by law entitled on the outbreak of war. Injustice is antipathetic to our race; and as, from our point of view as gas administrators, our shareholders are clearly the victims of a great injustice at the present time, we may usefully inquire whether we must ourselves accept any responsibility for the position?

From the viewpoint of to-day, it is clear that all the leaders of the industry who in 1915 and 1916 refused to take any action to safeguard the position of shareholders in sliding-scale companies were wrong; for they have since been compelled to take action. The probable effects of a state of war were clearly pointed out to the Committee of the Gas Companies' Protection Association, in October, 1915; and, despite much labour on the part of several pioneers, no action was taken until the damage was done, and the losses which were forecasted, and which might conceivably have been forestalled, had become accomplished facts.

Between us and a proper measure of relief then stood the relatively great gain which relief represented to owners of gas stock; and the fact that the losses ought never to have taken place failed to help us, as we had acquiesced in the position, and accepted our losses without effective protest. I had, as long ago as October, 1914, reported to my Directors as follows:

> "On the surface, the sliding-scale of dividend is a perfectly and ideally fair arrangement; for it secures to the consumer the lion's share of any economies effected, and, on the other hand, he pays most of any increased costs of manufacture. The war, for the first time, throws into prominence a marked weakness of the system—it takes no account of fluctuations in the value of gold."
>
> "Our industry may soon be faced with situations involving relatively great increases in the price of gas; and in this case, with everything purchasable at famine prices, shareholders may conceivably be faced with greatly reduced dividends. Such a situation would be manifestly unfair; and it is to be hoped that efforts will be made in good time to secure such amelioration of existing legislation as will prevent so great a hardship to gas shareholders."

It is now seen that the amazing re-organization of the finances of the country on the basis of a new value of money is really the cause of all our troubles; for our dividends are fixed by the price of gas stated in terms of currency which, having lost its value, has become a false measure.

We find a popular and State recognition of this fact on every hand; yet the gas industry is still chained, through the sliding scale, to a financial order of things which has passed away, leaving gas undertakings as the solitary relics to remind us of the time when the sovereign was really worth 20s. Our plant has now a structural value of about £250 per £100 of cost; and our scrip is worth about £50 per £100—a disparity which would be ridiculous if it were not tragic, for it is indeed tragic to many.

Were the situation due to loss of our power to serve the public, it would, of course, be one with which we should have to be content, and either restore our usefulness or, like other obsolete industries, go under. To-day, however, the community appreciates our service as never before; and our difficulty is to supply all the gas demanded. National statistics are not available; but in York we increased last year (January to September) by 26¼ million c.ft., and this year shows a further increase of 20 millions.

In addition to the general injustice from which we are suffering, there are striking inequalities in the war losses of different companies, which clearly show how false and unjustifiable is the present state of affairs. York, for instance, presents rather a special case in connection with the relief controversy. Had we not been unfortunate enough to obtain an Act in 1912, we should have been able to pay our maximum dividend of 4 p.ct., with a maximum price for gas of 3s. 6d.

It is a striking fact that some maximum price companies provided their consumers with a cheaper supply than that furnished by sliding-scale undertakings; and York is an outstanding case of this kind. The York Gas Company, without any inducement of a financial nature to do so, gave for a long term of years a cheaper service to the citizens of York than almost any sliding-scale company. The following table shows very clearly the unique position of York:

District.	Number of Undertakings.	Average Standard Price.
		s. d.
Southern	29	3 8·89
Wales and Monmouth	4	3 11·50
Midlands	9	3 6·00
Eastern Counties	11	3 10·00
Lancashire	7	3 8·70
Yorkshire (excluding York)	12	3 11·16
North of England	11	3 8·54
——	83	3 9·26 (Direct Average)
York		2s. 3d.

The standard prices shown in the table were granted after 1875;

and it is noteworthy that in 1870 the price of gas in York was only 3s. 4d. per 1000 c.ft., while in 1877 (the year in which the sliding scale first found its place in the Standing Orders of the House of Commons), it was 2s. 6d. The explanation of this fine record is undoubtedly to be found in the fact that the management of the Company has always been filled with the ambition to sell cheap gas to the public.

Such an enthusiasm for cheap service resulting in so great advantages to the community, deserves appreciation and reward; but, unfortunately, when before Parliament in 1912 no evidence of the good will to which its record entitled the Company was apparent; and the opposition of the City Council was pressed with the utmost severity, with the result that the Company received no consideration for its excellent history, and was granted the lowest standard price ever known, without any neutral zone to provide for exceptional circumstances. The Company's record of prices during the war is as follows:

Year.	March Quarter.	June Quarter.	Sept. Quarter.	Dec. Quarter.	Average.
	s. d.	s. d.	s. d.	s. d.	s. d.
1914	2 1	2 1	2 1	2 1	2 1
1915	2 1	2 3	2 3	2 3	2 2¼
1916	2 7	2 7	2 7	2 7	2 7
1917	2 7	2 7	2 7	2 7	2 7
1918	2 4	2 5	2 7	2 7	2 5¾
1919	2 7	2 7	3 1	3 1	2 10

It will be noted that the price at the outbreak of war was 2s. 1d., and the highest price during the war period 2s. 7d.

The following figures are extracted from the return prepared by the National Gas Council last year for the information of the Board of Trade. It proves conclusively what has been said of the good service experienced by York, for in each class of undertaking the majority of those included in the return had a price as high as or higher than 2s. 7d. in 1914.

Type of Undertaking.	Number.	Prices 2s. 1d. or Less.	Prices 2s. 7d. or More.
Municipal	75	9	38
Maximum price	57	5	43
Sliding scale	84	6	55
	216	20	136

QUALITY OF GAS.

The Gas Investigation Committee continues its useful work on the value of various grades of gas; and we anxiously await its final report. While doing so, we may find time to consider what guidance we can expect from their report and how far they may help us to solve the problem, "What is to be the gas of the future?" It would be unreasonable to expect more than a definite and unquestionable verdict as to the relative values of gases used each in the manner best suited to it, and perhaps some guidance as to the best chemical composition to be aimed at for various grades of gas. How any man can presume at this time of day to have permanently fixed opinions upon the question of the future quality of gas, is difficult to comprehend; for the problem is almost infinite in its complexity—involving the solution of many technical problems, and depending upon financial and other factors difficult or impossible to assess with any finality.

Between us and the adoption of a 20 p.ct. lower than the present calorific value of gas, we have the vast inertia of established facts in the shape of manufacturing plant, distributing systems and appliances, and the crucial factor of public opinion or prejudice. The only definite conclusion which seems at present possible is that the problem must be solved in the laboratory and the study, by those who, by training and temperament, are competent for the work, and then only by a process of evolution. It is worse than futile for those who think they are possessed of the whole solution—be their decision in favour of the high or the low, but who are unable to sway the general body of expert opinion in favour of their views—to seek to inflame popular opinion, and so impose their will upon the entire industry. Such action merely clogs the wheels of progress, and destroys public confidence in the *bona fides* of the profession as a whole. In the end the public will, of course, be guided by the consensus of competent opinion, and if that confidence in their *bona fides*, which I believe the gas engineers of this country deserve, can be obtained, questions of prejudice will be solved, and the truth emerge and be received. I hold that the factors of which the "best quality of gas" is a function, being fluid, the problem is incapable of final solution, and is essentially one to be settled by a process of evolution.

Let the industry be released from all control as to quality of gas, limited to its pre-war or such higher rate of dividend as may be thought just, and left to find its own salvation. Given such freedom of action, with no prospect of gain other than in forging stronger links of service to our customers, and so safeguarding the capital invested in gas, who can doubt that the stimulus to service through progress would be adequate, and the public interests better served than by any system of laying down qualifications to our freedom, however well meaning and justifiable such qualifications might appear at the time of their institution.

In concluding my reference to this question, I should like to say that I am a sceptic as to the practicability of low grades of gas in present circumstances, having regard to public opinion, and the existence of plant and appliances designed for gas of at least 500 B.Th.U. or over. The policy which, with perfect freedom of choice, I should myself follow, would certainly be to provide gas of an average of 500 B.Th.U. (assuming the materials for making such gas to be available), and to wait, before I contemplated supplying a lower value, until lower qualities justified their adoption, in the balance-sheets of the undertakings supplying them, and in the gas bills and satisfaction of their users.

A Vote of Thanks to the President.

Mr. A. W. Branson (West Hartlepool), in proposing a vote of thanks to the President for his able address, said the one point which specially appealed to him was the manner in which Mr. Bloor had dealt with the labour and economic problems. The outlook was certainly not over-bright; and the one ray of hope seemed to be vested in the Beilby report.

Mr. T. Hardie (Newcastle-on-Tyne) seconded, and remarked that they were looking upon Mr. Bloor as the philosopher of the Association. The President's address had been a really instructive as well as a constructive plan of campaign.

The vote having been unanimously carried,

The President suitably replied.

Visit to the York Gas-Works.

The members of the Association afterwards visited the works of the York Gas Company, where, on the invitation of the Directors, tea was served.

York Gas Company's Show-Rooms.

During the afternoon, the show-rooms of the York Gas Company were open for inspection, and many of the members availed themselves of the privilege.

MANCHESTER AND DISTRICT JUNIOR GAS ASSOCIATION.

The members of the Manchester and District Junior Gas Association met at the Leyland Motor-Works last Wednesday afternoon. The attendance was good, and all were interested in going through the well-appointed workshops, under the guidance of the firm's experts.

The visitors were surprised to find an extensive dining room or canteen capable of accommodating 1500 men, all dining at the same time. There are some twenty-eight electrically heated ovens for keeping the food warm after it has been cooked. Bread making machines were in evidence, also large coppers for the boiling of potatoes, &c. This department is managed by a committee of staff and workmen, and is entirely self-supporting. The foundry was particularly interesting, containing as it does gas-heated furnaces (town's gas), moulding machines, &c. All the latest types of machinery were to be seen in the various machine shops.

At the conclusion of the inspection, the party sat down to high-tea at the invitation of the firm. Afterwards Mr. Postlethwaite read his paper, entitled "Efficiency of Boilers and Power Distribution for Gas-Works"—*vide* "Journal," Sept. 30.

The President opened the discussion, and urged the necessity of pushing the sale of coke breeze for steam-raising.

Mr. Buckley (Manchester) said that as regards the author's statement that the placing of economizers in the main flue did not lower the efficiency of the chimney draft very materially, he (Mr. Buckley) disagreed, as the lowering of the temperature and the retarding of the flow of flue gases by reason of the economizer was only to be expected. He would also like to ask if the author had found corrosion taking place on the tubes at the point where the water enters.

Mr. Postlethwaite, in reply, said that the economizers he had in mind when he wrote the paper were more the ones attached to mill-boilers, and in these cases he thought that allowance was usually made in the design of the chimney to allow of ample draught. As regards corrosion, there was a difficulty here, as the metal varied so, and very peculiar results had been found. He thought that water-softening plants required most careful watching, as some of the methods were very crude; and as regards compounds while some gave good results, others caused more trouble.

Mr. Briggs (Preston) commented on the coke-dust that accumulated in the flues, and gave his experiences with coke-breeze firing.

Mr. Holton (Manchester) asked if the author knew of a chain-grate for the satisfactory burning of coke-breeze.

Mr. Dixon (Lancaster) and Mr. Stewart (Rochdale) also spoke; and, on the motion of Mr. Carter (Liverpool), seconded by Mr. Briggs, the author was heartily thanked for his paper.

Mr. Postlethwaite suitably replied.

The Painters' Pocket-Book.—The fourth edition of Mr. A. S. Jennings' "Painters' Pocket-Book" (with special contributions by Mr. Charles Harrison) has been published by Thomas Tofts, of Nos. 93-94, Chancery Lane, W.C., at the price of 4s. (post free 4s. 3d.). The book has been revised in all sections—particularly that relating to prices for painters' work; and the large sales achieved by previous editions, even without these alterations and additions, are proof that it is what it aims at being—a practical reference guide to everyday work. The dictionary of terms used in painting, building, architecture, art, applied chemistry, &c. (a very useful section of the book), has been revised; and several new tables have been introduced. Reference is facilitated by a full index.

MIDLAND JUNIOR GAS ASSOCIATION.

The New Session's Programme.

The first meeting of the Association for the session 1919-20 will be held in the reading-room at the Council House, Birmingham, next Saturday afternoon, when the new President (Mr. C. Carrington Barber) will deliver his address.

A representative of the newly-formed Association of Technical Gas Officials will attend to explain the objects and activities of the Society. As to this matter, the Hon. Secretary of the Association (Mr. H. W. Dean) says that, in conjunction with the Manchester Junior Gas Association, a meeting was held in Birmingham on May 24, when it was decided that action be taken to secure representation for juniors on any Committee that might be formed. In pursuance of this, the President and Hon. Secretary were present at a meeting held in London on May 29, when it was decided that the Association of Technical Gas Officials be formed. The admission of qualified technical assistants was secured, and a promise given that Junior Gas Associations should have representation on any Committee formed.

Mr. G. C. Pearson, Works Engineer, Windsor Street, Birmingham, is the representative of the Association on the Education Sub-Committee of the Institution of Gas Engineers, and is assisting in the formulation of a scheme of training and education for the future gas and distribution engineer.

Mr. T. H. Poulson, the President, drafted a set of proposals to increase the efficiency, co-operation, and influence of Junior Gas Associations. This has been considered by the Joint Council, and more frequent meetings of this body are to be held, when Mr. Poulson's project will be brought nearer fulfilment in the future. The agreement as to the necessity of each member taking a copy of the "Joint Transactions" is the first outcome of this idea. The following extended programme is arranged for the new session:

1919.
Nov. 6.—"Gas-Works Problems and their Solution," by Mr. R. A. S. Browning.
Nov. 8.—Visit to the Stourbridge Refractories Company, Limited, Pensnett.
Nov. 20.—"Scientific Instruments on Gas-Works," by Mr. J. H. Gee, B.Sc., A.I.C., and Mr. A. H. Mills.
Dec. 4.—"The Effect of 'Inerts' upon the Thermal Efficiency in the Use of Coal Gas," by Mr. J. W. Wood, M.Sc., of Leeds University.
Dec. 18.—"Some Gas-Furnace Installations," by Mr. H. R. Hems; and "Reconstruction of Sulphate of Ammonia Plant," by Mr. J. Poulson.

1920.
Jan. 10.—Visit to the Saltley Gas-Works.
Jan. 15.—Joint Meeting of the members of the Local Section of Electrical Engineers and the Midland Junior Gas Association, on the "Uses of Gas and Electricity for Heating and Power."
Jan. 31.—(Ladies' Evening.) "Gas Sales Problems," by Mr. R. J. Rogers.
Feb. 12.—"Boosting Gas Pressures," by Mr. T. H. Poulson; and "From Service-Pipe to Nominal Ledger," by Mr. W. P. Timbrell.
Feb. 26.—Paper by Mr. C. F. Tooby.
Feb. 28.—Joint Visit of Junior Gas Associations to the British Industries Fair, Birmingham.
Mar. 11.—"Coal Dust and Gas Explosions," by Mr. T. F. E. Rhead, M.Sc.
Mar. 18.—Visit to the Clay Cross Colliery, Chesterfield.
Apr. 1.—Debate, to be opened by Dr. E. W. Smith, F.I.C.
Apr. 29.—Annual General Meeting.
June .—Visit, details to be announced later.

CHAMBER-OVENS IN GAS-WORKS.

There is abstracted in the current issue of the "Journal of the Society of Chemical Industry" an article by Herr H. Koppers in the "Journal für Gasbeleuchtung," in which the writer points out that the regenerative coke-oven has a higher heat efficiency than the gas-retort; and the system is sufficiently flexible to allow of a diminution of output during slack periods. The size of the chamber-ovens required in gas-works will depend upon the gas production desired; the yield of a single oven varying from 42,000 c.ft. to 124,000 c.ft. of gas, and the charge taking place once each 24 hours. The table gives an indication of the yields obtainable and the quality of the gas. The values are those of an actual series of tests at Budapest, over a period of twelve months, with Koppers chamber-ovens:

Charge of raw coal	9·97 metric tons.
Yield of gas (per ton of coal)	14,000 c.ft.
Calorific value of gas (per c.ft.)	568 B.Th.U.
" " " (per lb. of coal)	3620 B.Th.U.
Nitrogen in gas	5·25 p.ct.
Fuel required (coke, calculated as raw coal)	10·25 p.ct.
" (coke per 1000 c.ft. gas)	184 lbs.

The yield of tar per ton of coal is 0·04 ton, and that of ammonia 0·003 ton. The labour is small; the following being the number of workers required for all the necessary processes:

For 100,000 c.m. in 24 hours, 17 workers.
200,000 " " 22 "
300,000 " " 32 "

The extra power required is small, being taken up in discharging the ovens. The power needed for discharging and levelling is not more than 30 kilowatt-hours per day. The quality of the coke is not a prime consideration in ordinary gas-works practice, and a much better quality is obtainable from chamber-ovens. Owing to the variation in composition of coal from layer to layer, the quality of the coke may be improved and rendered more uniform by a preliminary grinding of the coal. The extra power and labour for grinding is paid for by the increased value of the coke.

PRODUCTION OF WOOD GAS.

The following abstract has been taken from the "Technical Review" of an article in the "Zeitschrift des Vereines deutscher Ingenieure," by Dr. A. Sander, on the production of gas from wood during the war.

Denmark, Norway, Sweden, and Switzerland in particular have had recourse to this method of making gas, owing to coal shortage, though the process gives rise to many difficulties when carried out in the retort-furnaces used nowadays. This applies specially to acid condensates which are formed and attack pipe-lines, implements, gas-meters, &c. The high percentage of carbonic acid gas present in wood gas is not so derogatory as formerly, where incandescent lighting is practically universal. The big proportion of this gas, however, raises the specific gravity of the gas in the mains, and renders it necessary to readjust burners, &c. Lime purification of the gas is regarded as being too expensive now. A means of removing the carbonic acid gas has been found by reducing it to carbon monoxide by passing it over incandescent charcoal. This process raises the yield of gas, since, according to the equation $CO_2 + C = 2CO$, two volumes of CO are obtained from one of CO_2. Acetic acid can be removed from the gas by heating it considerably; the acid constituents remaining being neutralized with ammonia. For this purpose, a small (measured) quantity of coal is added to the wood-filled retort, and supplies the ammonia necessary.

Tests have been carried out at the Stockholm Gas-Works for obtaining wood gas in inclined retorts, and have given satisfactory results. The wood (Scotch fir) was in pieces 90 cm. long; the charcoal being removed so that the lower half of the retort was always just filled with it. The gas formed in the upper part of the retort passed over the glowing charcoal, and the acetic acid vapours were for the most part decomposed, and a part of the CO_2 reduced to CO. Further, the retort, which was 4·9 m. long, was filled at the upper end with coal to the extent of 10 p.ct. of the quantity of wood. Each charge comprised 50 kilos. of stacked wood, packed in two bundles. With a furnace temperature of 1200° C., two hours were required for gasification.

The yield of gas obtained fluctuated within fairly wide limits, according to the dryness of the wood. The percentage of moisture varied between 16 to 35 in the individual tests. From a ton of dry wood, 854 to 938 c.m. of gas (at 15° C. and 750 mm. atmos. pressure) was obtained; but when there was no layer of charcoal in the lower part of the retort, the gas yield was only 465 c.m. The specific gravity of the gas varied between 0·58 to 0·65; and the maximum calorific power, betweeen 3000 and 3300 (at 15° and 760 mm.). The gas had the following composition (according to the percentage of moisture in the wood):

	Per Cent.
CO_2	11·4 to 16·0
Heavy hydrocarbons	1·2 " 1·9
O	1·3 " 2·1
CO	21·8 " 26·1
Methane	9·1 " 14·9
H	44·5 " 47·1
N	1·6 " 3·7

The yield of charcoal was on the average 19 p.ct. calculated on a dry wood basis. It was in large pieces, and of good quality. The condensates, trapped in two vessels, showed an alkaline reaction, thus indicating that the coal added to the charge had performed its function. The tar obtained was very liquid, but contained denser constituents as well. Gas-producing tests with birch gave practically the same results, except that the charcoal was somewhat harder.

In gasifying wood, it must be remembered that gas is evolved very suddenly, and that, owing to this fact, greater quantities of aqueous condensates are obtained than result from coal. The charcoal (and coke mixed with it) obtained are very suitable for firing the generators, provided the air-inlet is throttled-down more. Owing to the satisfactory test results obtained, wood-gas production was carried on in Stockholm on a large scale—more than 40 p.ct. of the gas supply of the city being so obtained.

A somewhat different process was adopted in Denmark; peat and wood being alternately gasified in horizontal retorts, and, after cooling, mixed with coal gas. The wood and peat gas mixture obtained has a calorific value of 3700 to 4000 short calories (according to the quality of the peat); but after mixing it with coal gas, the calorific value is raised to 4200 to 4700 short calories. When wood gas is added to the coal gas in this way, it is necessary to reduce the air admitted to heating burners and lamps. No difference was noticed in the running of gas-engines from this mixed supply, except that the gas consumption rose to correspond with the lower calorific value of the gas.

In Finland, wood gas was manufactured at the Helsingfors

Gas-Works; the material being the dry waste from the extensive wood-reel factories of the country. Dessau vertical retorts are installed at these gas-works. Pettinkofer's process was used originally; steel pipes being inserted in the retorts for removing the tarry constituents of the gas. These pipes, however, were soon burnt, and were subsequently done away with in the process; the charcoal from three previous charges being left in the retort, and the gas being conducted over it. From 100 kilos. of coal about 40 c.m. of gas was obtained, containing some 20 p.ct. of CO_2, and having a calorific value of approximately 3000 short calories. The cost of production worked out at about 9d. per c.m. To prevent the various utensils from being attacked by acetic acid, they and the mains were flushed with water.

Germany also made wood gas in some of the gas-works during the war; but the results are scarcely worthy of mention.

TAR OILS IN GERMANY.

According to Professor H. Grossmann, of Berlin, says the "Technical Review" (quoting from the "Schweizerische-Chemiker Zeitung") successful attempts have been made during the war to render Germany independent of foreign sources of substances hitherto derived from imported petroleum oil. Large quantities of tar oil were obtained from coal; and it is computed that the annual production of 1,500,000 tons of gas and coke-oven tars should yield some 15,000 tons of such tar oils.

The production of tar by the low-temperature distillation of coal and lignites was also undertaken; but no accurate returns as to the quantity produced are yet available. The tar oils resemble petroleum very closely in chemical character, and can be utilized for the production of benzene, illuminating oil, lubricating oil, and paraffin. The yield of low-temperature tar from brown coal averages from 10 to 20 p.ct. of the dry substance; the yield from types of gas coal being about 8 to 12 p.ct. Two principal methods of procedure are employed for obtaining the low-temperature tars. In the one, the distillation of coal is effected at a temperature not exceeding 500° C.; much tar, and little gas and ammonia, being obtained. In the other method, which has hitherto been most generally employed, the coal is distilled in generators of various forms; the low-temperature distillates being removed without further subjection to a higher temperature than that of their production.

In working-up these tars, large quantities of phenolic substances are obtained; and the utilization in peace time of these products and of the coke produced is a pressing problem. Possibly Germany may be made entirely independent of imported tar oils by the use of the Bergin process, which renders possible the working-up of tar and tar products, including pitch, into very valuable materials, by subjecting them to the action of hydrogen. It may also be found possible to submit the raw coal or lignite to the action of hydrogen in such a manner that oil and benzene are obtained directly. The solution of this problem will put Germany on an entirely new footing as regards its supplies of combustible material and of power.

THE USE OF GAS IN SHIPBUILDING.

Some further particulars in regard to the use of gas in United States shipyards are given by Mr. J. J. Mulgrew, of the Industrial Gas Department of the Pacific Gas and Electric Company, in the pages of the "Pacific Service Magazine." Crude oil and coke are the fuels that have been generally used; but there are risks attaching to oil, which the substitution of gas obviates. Again, where rivets are heated by oil-fire or coke, a scale will occasionally form on the outside of the rivet; and when it is being driven, this scale will peel off, so that the rivet does not fit tight. It was found that gas rarely caused this scale; and, further, gas-fired rivets are comparatively free of pitting and iron burn. These defective heated rivets are readily detected and thrown aside. Where an oil-fired and gas-fired heater are worked side by side, the pile of cast-away rivets shows about four to one in favour of gas. Gas heating is not quite so quick as oil; but the difference is only a few seconds, and can be overcome by providing a larger gas fire-box, should this slight time saving be essential.

The Hanlon Shipyard and Dry Dock Company were the first to become interested in the possibilities of gas, which after investigation was adopted. There are three types of rivet-heaters in use. The fire-box is made of plate steel, lined with fire-brick; and the gas is connected by a ¾ in. pipe. The immediate saving secured is in the labour of cleaning-up necessary when oil or coke are used. The burners are specially made under the "Selas" system. For this process, there is a machine operated by a 10 H.P. motor. Air is taken in on one side, and gas on the other. The gas is then reduced to atmospheric pressure, so that the two are balanced; and both are drawn into a mixing chamber, in the proportion of 1 part gas to 1½ parts air. This mixture is compressed to about 4 lbs. pressure, and sent forward to the appliance. There the mixture passes through the bunsen air-mixer, where additional air enters for complete combustion. The pre-mixing of gas with air by the "Selas" system prepares the gas to readily saturate the air when it reaches the bunsen. The "Selas" machines are located in a central part of the plant; and the distribution pipes run from them to the different docks and shops, and up the sides of the ships, where connections are made by rubber garden hose to supply the rivet-heaters, which are generally located on the deck of the vessel from which the assembling is done.

An illustration is also given of a big furnace situated in the shops, in which iron up to 40 ft. in length is heated, being afterwards pulled out on to a platform full of square holes in which upright pegs or clamps are put, making the form round which the hot iron is bent to the desired shape. This particular furnace has been in constant use for over a year, and has had less than $50 expended on it in repairs. The gas is supplied by twenty burners arranged on each side, with the flame inclined upwards towards the arch; and gas is supplied by the "Selas" system. The furnace (the entire lining of which is of fire-brick) requires about 4½ hours to reach a working temperature of between 1860° and 2000° Fahr. Channel iron, 8 in. wide and 40 ft. long, is uniformly heated in about twenty minutes, and bent and hammered into shape with one heat; the gas consumption averaging 6000 c.ft. per hour. Small pieces of iron are heated in less time, and with less gas. There are other smaller furnaces for heating plates and for the case-hardening of special parts.

Some particulars have previously been given in the "JOURNAL" as to what is being done with gas by the Bethlehem Shipbuilding Company. The gas consumption of this concern alone is estimated at close upon a million cubic feet of gas per day.

RETORT-HOUSE ECONOMIES.

Some easily effected economies in the retort-house were pointed out by Mr. C. B. Wyckoff, the Superintendent of Manufacture of the Grand Rapids Gas Company, in a paper he submitted at the annual convention of the Michigan Gas Association. There will, he said, be found quite a few furnaces that will bear improvement. One frequent mistake is in the type of grate-rests. These are usually of the V notch shape, which look splendid on the drawings, but are a nuisance in operation. If the grate-bars always remained straight, then it would be advisable to use these V notches. But this is seldom the case; and the consequence is that two of the bars will be about 1 in. apart, and the next one will probably be 3 in. away, or they will be properly spaced at one end and spread out in the middle. The author's experience has been that a more satisfactory arrangement is to have ⊔-shaped notches. If during use the bars become bent downward (and this is the only way they can bend), they can readily be straightened, and the spacing will remain accurate. Some of the later installations have two clinkering-doors to each furnace. Theoretically this is a splendid idea, as they permit the cleaning of one-half of the fire without disturbing the other half. But there is really not much to be gained from this point of view, as the clinker men should at all times work in pairs; and if the furnace is efficiently operated, it will take only a very short time to clinker it, and no harm will result to the fire. A fire should never be allowed to "burn down" before cleaning. This policy is frequently practised; but it is unnecessary, and very detrimental to the heats and to the bench itself. Nothing is more harmful to an installation than to allow complete combustion to take place in the furnace; and this is what happens with a low fire. Theoretically the amount of primary air required by different retort-benches of the same size and type should be just the same; but this will not work out in practice, as it seems that benches are creatures of temperament, and that conditions upon which one bench will thrive may cause a serious case of indigestion with another of the same individual type. Actually, there is one and only one certain amount of primary air required for each individual bench, and this can be determined only by operation. Too much air is more harmful than too little.

The question of the gas supply (which was cut off during the railway strike) was raised at last Tuesday's meeting of the Billingshurst Parish Council. It was stated that, as soon as coal could be procured, the supply would be resumed.

A verdict of "Accidental death" was returned at an inquest on Thursday last on the body of Thomas Felix, aged 57, a bricksetter in the employ of the Manchester Corporation Gas Department, who fell from some scaffolding erected on the wall of the Gaythorne Gas-Works on the previous Monday, and died later in hospital.

Announcement is made in our advertisement columns to-day of the sale, by order of the Directors, of £25,000 of 6 p.ct. redeemable preference stock in the Brighton and Hove General Gas Company. The stock will be offered by Messrs. A. & W. Richards, of No. 37, Walbrook, E.C., at the Cannon Street Hotel, on Tuesday, Nov. 4. It is to be redeemed at par on Dec. 31, 1926.

At a meeting of the Stockton-on-Tees Town Council, Mr. Wilkinson asked if the loan had yet been sanctioned for the installation of vertical retorts at the gas-works. If not, could any information be given as to the influence of this delay upon the completion of the contract before the winter of 1920? The Mayor (Alderman Sir John Harrison) said sanction had not been received; but there had been no delay that he knew of.

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

Determining Calorific Power under the Beilby Report.

SIR,—I regret that in my article on the choice of calorific power I did not further develop the commercial aspect; but as the article appeared to me to be long enough for publication in its present form, I refrained from making any additions. I naturally assumed it would be an easy matter for anyone interested to calculate the effect of saving a penny per unit in manufacturing gas by the cheapest method. Taking two of the grades investigated, the following figures may be extracted:

	550 B.Th.U. Gas (Straight Coal Gas).		400 B.Th.U. Gas (Steaming Verticals).
Cost of manufacture per 100,000 B.Th.U. . . .	d. 5·78	..	d. 4·78
Cost of distribution . . .	2·97	..	3·25
Capital charges (say) . . .	2·00	..	2·00
Total	10·75	..	10·03

Taking the capital charges as equal, and assuming a standard price of 11d. per unit, it is clear that the first-mentioned undertaking could sell at 10¾d. a unit earning one increment of dividend, and the second could sell at 10d. earning four increments of dividend. This appears to be the essence of the commercial aspect.

It will be remembered that in my first article it was shown that ¼d. per unit would be practically equal to our present increment of 1d. per 1000 c.ft.

One cannot, of course, overlook the point to which you drew attention in your editorial last week—viz., that whereas in the first-mentioned case, 6·6 million B.Th.U. as gaseous fuel are sold per ton of coal carbonized, in the second instance 9·6 million B.Th.U. are sold. It must be remembered, however, that in the first instance an extra sale of 2 cwt. of coke must be expected, which, at 12,500 B.Th.U. per lb. amounts to 2·8 million B.Th.U., which will practically make up the balance. As we are producers of gaseous energy, it is obviously uneconomical to sell coke in preference to gas; and this is apparent in my original investigation, showing the result of 1d. per unit saved taking every factor into consideration.

ENGINEER.

Oct. 18, 1919.

REGISTER OF PATENTS.

Distillation of Coal.—No. 132,576.

ANDERSON, F. A., of Kensington, W., DEACON, M., of Whatstandwell, near Matlock, and BRADY, N. P. W., of St. Helens Place, E.C.

No. 13,221; Aug. 14, 1918.

This invention provides a process for distilling coal, shale, &c., by causing it to traverse a closed chamber, and, as it does so—first heating it to successively increasing temperatures up to a maximum, and then cooling it in its continued progress within the chamber down to a lower temperature. A further provision is a heating duct, which follows a zig-zag course extending along the direction in which the charge is fed, and is "supplied with heat at such point or points that the flow of heat is in the opposite sense to that of the travel of the charge." The means to heat the furnace are so arranged that the temperatures at the two ends are comparatively low, and rise to a maximum about the centre.

A central vertical longitudinal section (diagrammatic in character) through the furnace is given; also a horizontal section through part of the bed showing the preferred form of heating means.

In the furnace bed A is a zig-zag heating duct B. Heat is supplied to the duct by gas-burners at B^2 and/or at additional points, such as B^3. The windings of the duct are more close together at about the centre, and no heating means are provided towards the right-hand (the discharge) end. A mechanically-operated conveyor F travels along the hearth from the inlet to the discharge end. It enters and leaves the furnace through liquid seals F^1. Charging and discharging hoppers are provided at G G^1, fitted with traps to prevent the escape of the gaseous contents of the furnace. The traps are indicated diagrammatically by the double doors H.

In use, the furnace has its bed heated by the duct B in such a way that the temperature gradually increases from the inlet-end to the centre, where it reaches a maximum, from which point the temperature falls more or less rapidly towards the outlet end. Coal fed in by the hopper G is carried upon the conveyor in the direction of the arrow, and as it traverses the hearth it is subjected to a rising temperature and gives off distillates requiring successively higher temperatures to distil them. Having reached the hottest portion of the furnace at A^1, it cools in passing to the discharge outlet, and is discharged through the hopper G^1 at a sufficiently low temperature to be exposed safely to the atmosphere. The duct B serves therefore to produce successively increasing temperatures in the charge from the point of entry up to the point A^1. If desired, ducts, as indicated in dotted lines at B^1, may be formed to gather heat from the coal as it cools and supply heated air and/or gas for the duct B.

Exhaust-fans E are employed in conjunction with exhaust-ducts D and any sensitive form of pressure gauge, to prevent excessive accumulation of gaseous distillate in any particular cavity of the roof.

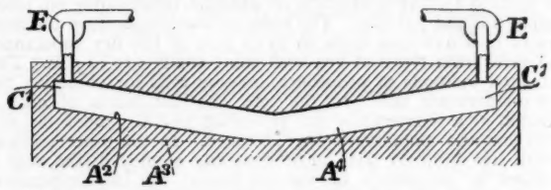
Furnaces for the Distillation of Coal.—No. 132,744.

ANDERSON, F. A., of Kensington, W., DEACON, M., of Whatstandwell, near Matlock, and BRADY, N. P. W., of St. Helens Place, E.C.

No. 10,624; Aug. 14, 1918.

According to this invention, the furnace for the distillation of the coal is provided with inverted pockets in its roof "to collect diverse distillates in the manner described"—one or more of the pockets being provided with a sloping roof whose gradient from the higher end downwards is in the direction of the forward travel of the fuel beneath it. Preferably one or more of the cavities meets its neighbour so as to form a sharp dividing edge.

One of the drawings to illustrate the invention is similar to that accompanying patent No. 132,576 (*supra*); the other, here given, shows an alternative construction.



Anderson, Deacon, and Brady's Coal-Distillation Furnace.

The under-surface of the roof is formed with cavities C, which give it a saw-tooth shape and constitute inverted pockets into which the gaseous distillates rise and are collected. The slope of the pockets is in the direction shown in the drawings, with the higher point in each nearer to the inlet-end than the lower point. Thus, should partial condensation of the distillates occur in any pocket, it would tend to trickle down the slope of the top of the pocket in the same direction as that in which the charge is being carried upon the conveyor. The condensed matter thus tends always to pass forward to a hotter portion of the furnace, instead of being repeatedly carried through the same zone as it would be were the slope of the pockets in the opposite direction, except after the hottest part of the furnace has been passed, "after which point the distillates are usually unimportant."

In the alternative construction, the gaseous distillates are divided into two classes only; the roof being V-shaped in form and the hearth either shaped as at A^2, so that its surface lies parallel with that of the roof (as indicated in full line), or so as to provide a flat horizontal surface, as in the dotted line A^3. With this construction, only two pockets C^1 are formed; and the hottest portion of the furnace is preferably at about the position A^4.

Gas Cleaning Apparatus.—No. 132,586.

LIVERSEDGE, A. J., of Essex Street, Strand, W.C., and DAVIDSON, W. B., of Edgerton, Huddersfield.

No. 13,938; Aug. 27, 1918. No. 1267; Jan. 17, 1919.

This combined invention has for its particular object to provide convenient apparatus for effecting "a more complete separation of suspended

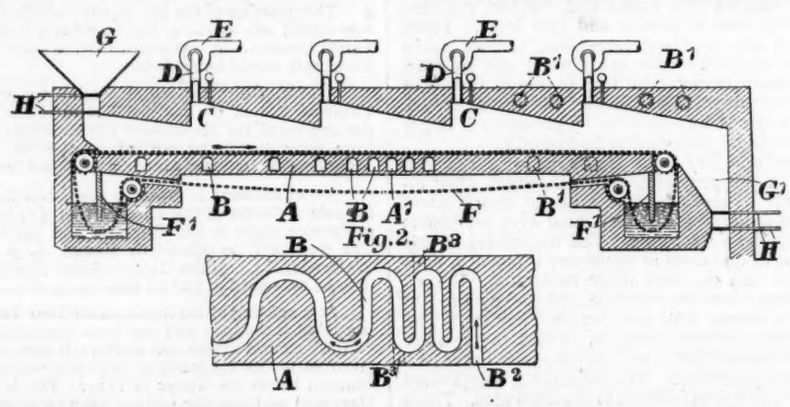


Fig. 2.

Anderson, Deacon, and Brady's Coal-Distillation Plant.

matter from gas than has hitherto been obtainable, and one in which the matter is not thrown against the casing." The invention further relates to apparatus wherein, by means of rotary fan-like mechanism and baffle-discs, the uncleaned gas entering the apparatus has to "take a tortuous path" and become subjected to centrifugal action, which will tend to cause separation of its heavier constituents from its lighter constituents.

An illustrated article describing, in detail, the plant and its working appeared in the "JOURNAL" for Sept. 9, p. 554.

Water-Heaters.—No. 132,598.

CREASEY, H. H., of Winchmore Hill, N., BECKET, W. H., of Carshalton, and PARKINSON STOVE COMPANY, Ltd., of Kennington, S.E.

No. 15,051; Sept. 16, 1918.

Water-heaters as at present generally constructed are, the patentees point out, adapted either for the supply at will of a small quantity of water at or near the boiling point, or a large quantity of water at a lower temperature; but none of them are suited for the "economical supply of water at either temperature as desired, and capable of producing the small quantity rapidly."

The object of the present invention is "to provide a water-heater fulfilling these somewhat antagonistic requirements."

In one form, as applied to a domestic water-heater using gaseous fuel and arranged for use with a supply giving a water level in the storage vessel below its top, a cylindrical storage chamber is employed having a central flue and a shallow directly heated chamber nested within its lower end, so that the flue at its lower end is annular. The whole is supported by a casing within which a heating ring is mounted in such a way that it can be swung-out to engage a support for use as a boiling or cooking ring when desired. From the central heating chamber a water-pipe passes up through the centre of the upper flue, and is turned through its wall with a downwardly directed bend into the storage chamber above the water level therein. As the water can only pass over by boiling, it forms a safety vent. Within the central flue a spiral or other form of baffle facilitates the abstraction of heat from the products of combustion. Another pipe is led from the upper part of the central heating chamber to the main chamber near its top but below the water level; and this pipe is provided with a circulation controlling cock at its point of entry to the chamber. The upper part of the storage vessel may itself be provided with a vent, delivering into the cold water supply tank above its water level. The cold water supply is connected to the bottom of the main chamber, and the central heating chamber, heated directly by the burner, is connected to the main chamber by a vertical tube leading from near its bottom to a point somewhat above the bottom of the main chamber, so that partially warmed water usually enters the directly-heated chamber.

In operation, when very hot water is desired the circulation cock is closed and the gas lighted. After a few minutes, nearly boiling water can be withdrawn at the delivery points—the bulk of the water in the main chamber being but little raised in temperature, as it is only heated by the flue gases and has only its own connection circulation. When, on the other hand, a bath supply is wanted, the circulation cock is opened, and the generation of hot water in the directly-heated chamber sets up a rapid circulation through the store chamber.

The invention may be applied to pressure systems with the appropriate alterations, in which case a separate vent will be required for the directly heated chamber in addition to the usual vent or "expansion" pipe passing from the top of the storage chamber.

Fig. 1 shows the invention as applied to a domestic water-heater using gaseous fuel and arranged for use with a supply giving a water level in the storage vessel below its top. Fig. 2 shows the invention (as in fig. 1), but mainly intended for a low-pressure system. Fig. 3 illustrates a modification applied for a comparatively high-pressure system—that is, one in which the reservoir is normally completely filled with water; the cold water cistern being placed at some level above the heater.

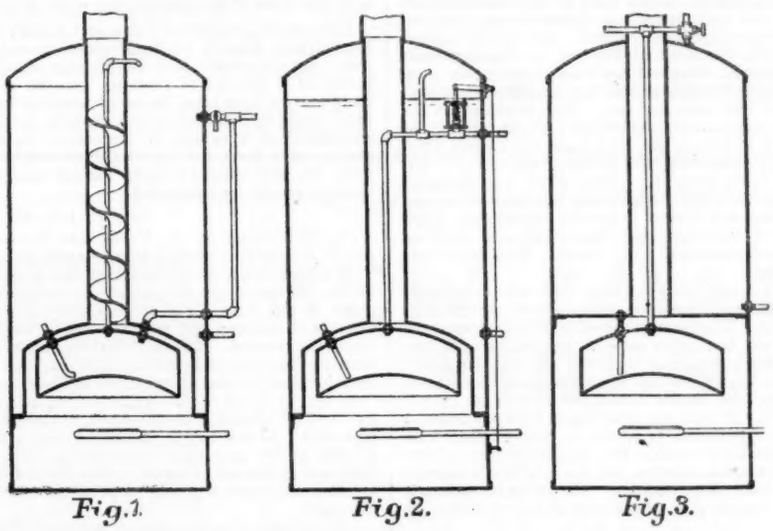


Fig. 1. *Fig. 2.* *Fig. 3.*

Creasey and Becket's (Parkinson Stove Company) Gas Water-Heaters.

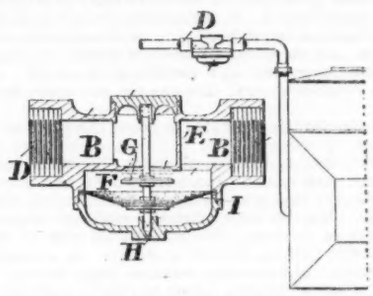
Safety-Valve for Gas-Meters.—No. 132,659.

CLARK, J. G., of Hornsey, N., and LARKIN, F. S., of Putney, S.W.

No. 17,694; Oct. 30, 1918.

Where gas-meters are employed for the measurement of gas supplied to gas-engines, compressors, or the like, it sometimes happens (the patentees remark) that, "by the accidental closing of the inlet valve, the supply of gas to the inlet of the meter becomes restricted, in which case the gas-engine or compressor tends to exhaust the gas in the meter so as to lower the pressure inside to such a degree that the meter case is unable to bear the atmospheric pressure on its outer surfaces, and ultimately it collapses." Their invention has for its object to provide means whereby, in the event of the demand for gas exceeding the discharge or measuring capacity of the meter, the flow of gas from the meter is automatically cut off at the outlet, and any damage is in this way avoided.

A sectional view of the valve is given; also an elevation showing its application to the meter.



Clark and Larkin's Safety-Valve for Gas-Meters.

Extending across the passage B is a partition E, at the base of which is an opening communicating with a chamber F closed by a cap bearing a screw-thread engaging a thread on the wall of the chamber. G is a valve for controlling the passage of gas to the outlet D. The valve G is mounted upon a stem or spindle the lower end of which is coned and terminates in a perforation H through which air may be admitted to the chamber under control of the valve-like action of the lower end of the spindle. The valve is floatingly mounted within the chamber F by means of the diaphragm I, to which the spindle is connected. The valve is secured to the outlet pipe of the meter; and so long as the normal load only is being thrown upon it, the pressure of the gas acts upon the diaphragm to keep the valve open and permit the passage of the gas from the meter. But should the normal load be exceeded—whereby a partial vacuum is formed in the meter—the diaphragm to which the valve is attached will be actuated to cause it to be forced upon its seating, and the gas supply will be cut off.

The area of the ports for the passage of the gas is so proportioned as to permit of the passage of such a quantity of gas as may be regarded as the maximum for the particular meter, whereby, in the event of a load being placed upon the meter which is seriously greater than it is designed to supply, the ineffective working of the gas appliances supplied by the meter will indicate that the load is excessive. The weight of the parts is such that, normally, the air-inlet H is sufficiently closed to prevent any serious leak of gas to the atmosphere, should the diaphragm become porous or broken.

The Hull Corporation are being pressed to make greater use of their own electricity undertaking for street lighting. It is proposed that the main roads of the city should be lighted by electricity, instead of gas, which, it is pointed out, has increased in price out of all proportion to electricity.

LEGAL INTELLIGENCE.

SEIZURE OF FOREIGN MANTLES.

At Tower Bridge Police Court last Thursday week, before Mr. GILL, David Mandler, of 223, Borough High Street, trading as the Crown Light and Fittings Company, appeared in answer to adjourned summonses to show cause why five cases of incandescent gas mantles, imported by him, should not be condemned as forfeited. E. A. Wood, of Birmingham, was similarly summoned in respect of four cases.

Evidence showed that the cases of mantles were seized by Customs officers on Sept. 25, 1916, at Butler's Wharf, under the Customs (War Powers) Act, as they were believed to be of enemy origin, having been consigned by a Mr. Beudeker to Mandler from Rotterdam. A concession made by the Foreign Office in April, 1916, enabled gas-mantles to be imported, provided that not more than 25 p.ct. of their value was due to enemy origin. A declaration was sworn before the English Consul in Holland that only 20 p.ct. of the material in these was of enemy origin; but there was a statement written on it that this declaration must not be taken as a certificate of origin. Expert examination of the mantles showed this was not the case; and they were seized.

Mr. DART said it was for the claimants to prove the place of origin of the mantles.

Mr. TRAVERS HUMPHREYS, for the claimant (Beudeker) said the mantles in question were worth £500. His client was a *bond-fide* incandescent mantle manufacturer on his own account in Haarlem long before the war. Mantles were originally made of ramie thread saturated with nitrate of thorium. These materials were of German origin, and consequently became difficult to obtain. In consequence, he discovered a method of extracting thorium from the ash of old mantles, and found a way of treating cotton so that it could be used in place of ramie. An expert from England had visited his factory; and he was satisfied that the greater proportion of material used in making mantles for the English market was not of enemy origin, and that the amount did not average 22 p.ct. of the whole. These details had also been supplied to the British Consul when the declaration was made.

Mr. *Beudeker*, called to support his claim, said he was established as a gas-mantle maker in 1897. He gave the total cost per 1000 and the percentages of material of German origin used in their manufacture. In the last consignment the percentage was higher, because he had used German packing cases and cardboard boxes. This would increase the percentage to about 13 p.ct. Both of the last two consignments went to Mandler and Wood. Between April and September, 1916, thirty cases or more of these mantles passed the Customs when consigned to Wood; and they had been paid for. They were exactly the same as those under discussion. In September, 1916, Mr. Robin, of Streatham, was introduced to him by Mr. Van Dam, the British Vice-Consul. After thoroughly examining the factory, witness and Mr. Robin signed a document in the form of a report, which was witnessed by the Vice-Consul, to the effect that he (witness) had been extracting thorium from waste. When Mr. Robin inspected the factory, there were 65 kilos of thorium of German origin there, and over 100 kilos of thorium which had been extracted from waste. This latter was used for the English market.

Cross-examined by Mr. DART, witness said that the statements showed the contents of the cases consigned to Mandler to have 20 p.ct. of material of enemy origin. The mantles passed by the Customs were just the same as those in the last cases seized. He had no idea that Mr. Robin, the Government expert, said this was not so. He could not account for Mr. Robin having passed some and detained others. It was not a fact that when Mr. Robin visited the factory in 1915 it was hardly working at all. It was not true there were no finished mantles there at that date. With the 21 hands he then employed he could turn out 10,000 mantles a week. His maximum output was 30,000 a week. He could not say whether Mr. Bark, of the Welsbach Company, had examined some of his mantles. He would be surprised if he said there was more than 25 p.ct. of material of enemy origin, or 50 p.ct.

Mr. GILL asked if anyone could say where the thorium nitrate came from, once it was impregnated in the mantle.

Mr. DART said that either Mr. Robin or Mr. Bark could pick up a mantle and say whether or not it was of German origin.

The hearing was adjourned till Nov. 5, at a special sitting of the Court.

Liability for Gas Consumed through Slot Meters.

At the Stockport Borough Police Court on Wednesday last, an application to enforce the payment of £1 15s. 1d. and 2s. 6d. costs in respect of gas supplied was made by the Stockport Corporation against Mabel Vines. Mr. John Rimington, giving evidence for the prosecution, said the amount due had been demanded, but still remained unpaid. The account was based on the index reading of the meter. In the agreement signed between the defendant and the Corporation was a clause to the effect that the Corporation and the consumer were bound by the index reading of the meter, and any deficiency or surplus was to be made good by either side. From January to March the meter registered £1 4s. 10d.; but there was only 7s. 1d. in the box. From March to June, there was only 7s. 6d. in the box. This left deficiencies of 17s. 9d. and 17s. 4d. respectively. The defendant's husband stated that the cash attachment to the meter was out of order. He had personally called on several occasions at the Town Hall and also at the gas-works to report the matter, as the meter was passing gas without payment, while at times they had to put in three or four pennies before it acted. They had been told by an inspector to "thump" the meter. A woman inspector called round to see the meter, which, she said, was out of order, and on March 15 an account was received for 2900 c.ft. of gas; and this amount was computed. Six days later, a further account for 4800 c.ft. was sent in—it being stated that the first account was a clerical error. Mr. Rimington said the explanation was that a clerical error in regard to the first account had been made. It was found that when the meter was tested, it was registering correctly the number of feet of gas consumed, and only the cash attachment was wrong. Defendant was ordered to pay the account.

Belfast Gas Stealing Case.

At Belfast Custody Court, on the 10th inst., Peter Convery, who had previously been fined £100 for having two illicit stills in his house at Park Avenue, Standtown, was charged with stealing gas belonging to the Belfast Corporation. Mr. Alex. Cleland, the Distribution Superintendent, said that from Dec. 13, 1918, to the 1st inst., there was no meter in the house. On Oct. 1, a meter was put in, with a capacity of 60 c.ft. per hour. The distance from the meter to where the stills were found was 97 ft. 6 in.; and intersecting the distance were a number of walls 4½ in. thick, in each of which, at the level of the floor, was a hole the size of a half-brick. Witness had been shown 101 ft. of iron gas-piping, and could say that gas passed through it recently. He had also inspected two copper stills, three high-power gas-burners, and a quantity of rubber-tubing; and in his opinion the stills had been heated by gas. The amount of gas that would be required to distil 168 gallons of spirit at the second distillation would be 16,800 c.ft. As the spirit had been distilled twice, some 36,000 c.ft. of gas must have been used; and the total value would be about £8 9s. 5d. For the defence, it was urged that accused yielded to the temptation to make money easily, and ventured on illicit distillation. It was asked that the case should be summarily dealt with. District Inspector Holmes, of the Royal Irish Constabulary, described the case as very bad; and the Resident Magistrate sent the accused for trial, allowing bail.

MISCELLANEOUS NEWS.

REPORT OF THE LIVESEY PROFESSOR AT LEEDS.

Prof. John W. Cobb, C.B.E. (Livesey Professor at the University of Leeds), has presented his sixth annual report to the Chairman (Mr. C. F. Tetley) and members of the Livesey Advisory Committee on the work of the Department of Coal Gas and Fuel Industries. It deals with the work of the two sessions 1917-18 and 1918-19.

The opening portion of the report states that in the session 1917-18 the teaching work in the department was reduced to a very small compass; but the second and third terms of 1918-19 have witnessed the return of a number of students and the entry of others. Some of these entries have been rendered possible by the Government allowance made to selected ex-service men considered capable of taking advantage of a course of University training. The ordinary day classes have been held in the Properties of Gases, Technology of Fuel, &c., and special evening lecture courses as detailed below have been given and well attended.

SESSION 1917-18.

(1) *Oil-Washing and the Naphthalene Problem* (four lectures) given by Mr. A. Edwards, Chief Chemist, Leeds Corporation Gas Department. This course was a development of one given in the previous session by Mr. Edwards, but in which more complete consideration could be given to the scientific principles underlying oil-washing for the extraction of benzene and toluene, and to results obtained in the working of the process. The naphthalene problem is one which is involved more or less with the washing process; and its urgency and importance justified its special treatment in these lectures.

(2) *Recent Developments in Carbonizing Practice* (four lectures) given by Dr. E. W. Smith, Chief Chemist, Birmingham Corporation Gas Department. In this course conditions and results in the carbonization of coal at low and high temperatures were compared, with special reference to the use of steam; while the characteristics of internal and external producers and their application to the heating of setings were discussed.

(3) *Refractory Materials* (eight lectures) given by Prof. Cobb. The importance of this subject is coming to be more widely recognized. The course dealt with raw materials, methods of manufacture, and testing, with the choice and use of refractory materials for gas retorts and settings, coke-ovens, and steel and other industrial furnaces. The glass industry provided a considerable number of students.

SESSION 1918-19.

(1) *Bye-Product Coking* (eight lectures) given by Mr. Greaves. This course is given in alternate sessions; and its subject matter is of growing importance. The use of coke-oven gas for public supply received special attention.

(2) *Furnaces and the Utilization of Fuel* (six lectures), given by Prof. Cobb. This course was intended to supply some knowledge of the scientific principles underlying the utilization of fuel and the construction and management of furnaces.

(3) *Qualities of Gas and Efficiencies in Use* (two lectures), given by Mr. James W. Wood, M.Sc., A.I.C., Research Chemist in the Department. The undesirability and impracticability of any reversion in the country to the old standards for gas and the interest on the subject aroused by the report of the Gas Investigation Committee, made it very desirable that an account of the tests made should be given in lecture form by Mr. Wood, who had been directly responsible for the experimental work involved therein.

(4) *Economical Steam-Raising* (two lectures), given by Mr. Basil G. M'Lellan, Chemical Engineer to Messrs. Rowntree & Co., Ltd., York. The existing shortage of fuel has led to greatly increased interest in the scientific arrangement and control of steam-raising plant, and particularly in the use of coke and low-grade fuel.

DONATIONS.

Prof. Cobb has great pleasure in recording a donation of £25 by Mr. Albert Cliff, of Stamford, to be used in the furtherance of the study of refractory materials in the department. In his last report he

referred to the gift by Mr. Henry Woodall, Jun., of an experimental gas plant to be attached to the department; and though the erection could not at that time be commenced, he is glad to say that conditions are now such as to permit the construction of the plant. He trusts that completion will not be long delayed. It is proposed to erect several small units specially designed for experimental work. They will include horizontal retorts to be worked in series or in parallel, vertical retorts in the design of which Sir Arthur Duckham and Sir William J. Jones are interesting themselves, and a blue water-gas (or producer-gas) generator by Messrs. Humphreys and Glasgow, with arrangement for coal carburetting. It is, he adds, very gratifying to see the work of the department assisted in this manner, and very desirable that such private benefactions should be made so as to ensure to the University freedom and the power of initiative in its work.

STAFF.

In the last report were foreshadowed the directions in which it was proposed to develop the department when circumstances became more favourable. Some effect has been given to the proposals then sanctioned by the appointment of Mr. H. S. Houldsworth as Research Assistant and Assistant Lecturer in Refractory Materials. Mr. Houldsworth graduated with first-class honours in Physics in the University, and has had considerable experience in the department during the last two years. It is also proposed to proceed forthwith with a similar appointment in connection with the teaching of Metallurgy in the department. This is intended to provide mainly for teaching and research in non-ferrous metallurgy and engineering alloys. There seems to be a definite place and demand for more advanced treatment of Metallurgy in this locality than can be provided in any institution below University rank.

RESEARCH.

The research staff has been considerably increased in the period reviewed. The Gas Research Fellowship remained vacant during the period of the war, but has been again filled by the appointment of Mr. T. Hanby, B.Sc. (first-class honours in Chemistry), who is continuing work on the decomposition of the products of carbonization by red-hot coke and radiant heat.

Several appointments have been made in connection with the work of the Gas Heating, Lighting, and Ventilation Research Committee, which is acting as a Research Sub-Committee for the Gas Investigation Committee of the Institution of Gas Engineers. The scope of the research work and inquiry undertaken by this Committee has been enlarged. It was limited in the first place to the relative efficiency in use of different grades and compositions of gas. The experimental part of the work has been in the hands of Mr. James W. Wood, M.Sc., A.I.C. Two reports have been already presented to the Institution of Gas Engineers; and it is believed that the results obtained have been of very considerable value in providing a national basis for the establishment of new gas standards.

Another parallel branch of investigation has been commenced—that of relative economies in the production of gas by different methods. For this purpose the generous offer of Mr. Lawrence Hislop and the Uddingston Gas Company to allow investigation on the large scale at their Uddingston works has been of great service. The Research Chemist now in immediate charge of these experiments (Dr. A. Parker) entered on his duties there in February last. Two assistants have since been appointed—Mr. H. Kerr, who holds the Diploma in Fuel and Metallurgy of the department, and Mr. F. S. Townsend, B.Sc. (London). The appointment of a third assistant is projected. The attitude of the Institution of Gas Engineers in this and other matters is expressive of complete confidence in the work of the University.

WORKS VISITS.

Thanks are due to a number of undertakings for kindness in affording opportunities for students to visit their plants and obtain experience in industrial practice.

Prof. Cobb concludes his report as follows: Now that the period of the war is completed, I should like to express my gratitude to those who have exerted themselves so unsparingly on my staff for the special work which we were called upon to carry out in that connection, and especially to my chief assistant, Mr. H. J. Hodsman, for the unremitting care and skill bestowed upon his duties as my official deputy.

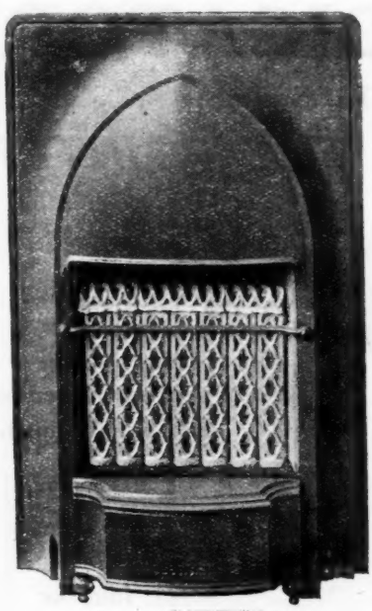
I may point out that the department appears to be arriving now at maturity. Next session, for the first time, the capacity of the laboratories promises to be fully taxed. The shortage of coal has brought the study of fuel, and especially of gaseous fuel, into a prominence which seems likely to increase. The wisdom of the University in founding the Department, and the generosity of the gas industry in endowing the Livesey Chair, seem to have been justified by events; and confirmation is found in the conviction expressed in the Coal Conservation Report of the urgent need for a body of scientifically trained fuel experts to introduce and maintain those more refined methods of using fuel in the future which seem vital to our continued national prosperity.

LONDON COUNTY COUNCIL AND THE PRICE OF GAS IN THE METROPOLITAN AREA.

At last Tuesday's meeting of the London County Council—Lord DOWNHAM in the chair,

Mr. J. D. GILBERT, M.P., asked the Chairman of the Public Control Committee the following questions:

(1) Whether he is aware that the London Gas Companies have recently increased their prices to consumers in London?
(2) Can he state what are the increases of the various Companies per 1000 c.ft.?
(3) Can he state if the Companies are legally entitled to make these



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extra charges; and whether they have to supply any special standard gas for the prices they now charge?

Sir George Piggott, the Chairman of the Public Control Committee, said his answer to the first question was "Yes." The answer to the second question was that the increases from the September meter readings announced by the various Companies supplying in London were as follows:

Gas Light and Coke Company	from 4s. 2d. to 4s. 8d.
South Metropolitan Company	from 4s. 4d. to 4s. 8d.
Commercial Gas Company	Increase of 50 p.ct. in meter and fittings rentals.
Wandsworth	Increase of 50 p.ct. in meter and fittings rentals.
Brentford	from 4s. to 4s. 10d.

No definite notice of increase had been given by the South Suburban Company, but application had been made to the Board of Trade for authority to increase the price from 4s. to 5s. 6d. per 1000 c.ft. in the London area without suffering any further loss of dividend under the sliding-scale. Under the general law, the gas companies supplying in London were not limited as to the price which they might charge for gas. Under the ordinary sliding-scale provisions, increases in the price of gas were accompanied by a diminution of dividend; but under the Statutory Undertakings (Increase of Charges) Act, 1918, gas companies were entitled to apply to the Board of Trade for power to distribute dividends at three-fourths of the standard rate, notwithstanding the sliding-scale provisions. The Public Control Committee had made representations to the Board of Trade on the applications of the Companies under the Act, and had endeavoured to secure the fixing of maximum prices not more than sufficient to provide a dividend at the three-fourths rate. Of the cases mentioned under (2) the Board of Trade had only issued an Order in the case of the Gas Light and Coke Company. The several Companies supplying coal gas in the London area had different standards—some of illuminating power and some of calorific power. It might, however, be assumed that, by an Order of the Ministry of Munitions (made for war purposes and not yet revoked), such Companies were required to supply gas which should not fall below a calorific value of 450 B.Th.U. gross. On the occurrence of the recent railway strike, however, the Board of Trade issued an Order (presumably with a view to the conservation of coal supplies) by which all gas companies were forbidden to use a greater amount of coal than would suffice to produce gas of a quality 15 p.ct. lower than the previous standard. The standard calorific power, therefore, was now only 425 B.Th.U. It was possible that when the companies recover from the effects of the strike, this latter Order would be revoked.

Mr. Gilbert asked whether, in view of the importance of this matter to gas consumers in London, he would consider whether his Committee would bring up a report to the Council in order that they might express their views on the matter.

Sir George Piggott said the Committee had this matter fully in view, and everything was being done that could possibly be done in order to settle the question of the raising of the price of gas.

Miss N. Adler asked the Chairman of the Public Control Committee the following questions:

(1) Whether he is aware that the Brentford Gas Company, which supplies gas to a large area in the poorer part of West London, has given notice that the Company proposes to raise the cost of gas from 4s. to 4s. 10d. per 1000 c.ft.?

(2) Whether such increase complies with section 1, subsection 1 (*b*) of the Statutory Undertakings (Temporary Increase of Charges) Act, 1918, by which no modification shall be authorized which is more than sufficient to enable, with due care and management, a dividend on the ordinary stock or shares of the undertaking to be paid at three-quarters of the standard or maximum rate of dividend, if any, prescribed for the undertaking, or at three-quarters of the pre-war rate of dividend, whichever is the lower?

Sir George Piggott said his reply to No. 1 question was "Yes." In regard to question No. 2, the information supplied by the Company was that, notwithstanding the increase in the price of gas to 4s. 10d. per 1000 c.ft., the revenue of the Company during the period ending December, 1920, would be insufficient by £36,000 to pay dividends at three-quarters of the standard rate. A report upon the Company's figures would be before the Public Control Committee on Friday next. The application of the Company for an Order modifying the sliding-scale conditions was still under consideration by the Board of Trade.

VERTICAL RETORTS FOR BEVERLEY.

An inquiry was held on Thursday last into an application by the Beverley Corporation to borrow £26,700 for thirty years, for the provision of vertical retorts at the gas-works. The application was opposed by a firm of rope manufacturers, on behalf of whom it was urged that independent advice should be obtained. Evidence was given by Mr. C. F. Pardoe, an electrical engineer, of Hull, that an electricity plant to supply Beverley could be installed for £15,000.

Mr. T. Hornby, Gas Manager of Hessle, said the existing beds of the retorts should be re-built and used as they were now; but, in reply to the Inspector, he admitted that hand stoking, with the present price of labour, was not economical. The Town Clerk stated that if the Corporation did not decrease the cost of production, they would have to charge a very high price for gas. Mr. F. W. Oldfield, Gas Engineer to the Corporation, estimated that the net saving which would result from this scheme would be £4610 on coal and £1200 on labour. The reduction in the price of gas would be not less than 6d. per 1000 c.ft.

The Paris Prefect of Police, with a view to economizing in the use of coal, has again put into operation the former restrictions on the external lighting of theatres, cafés, and restaurants.

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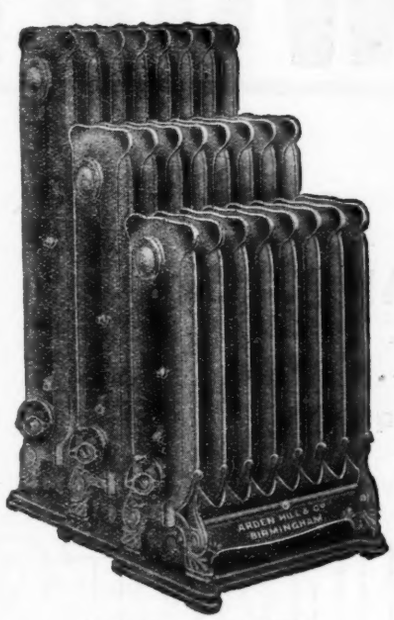

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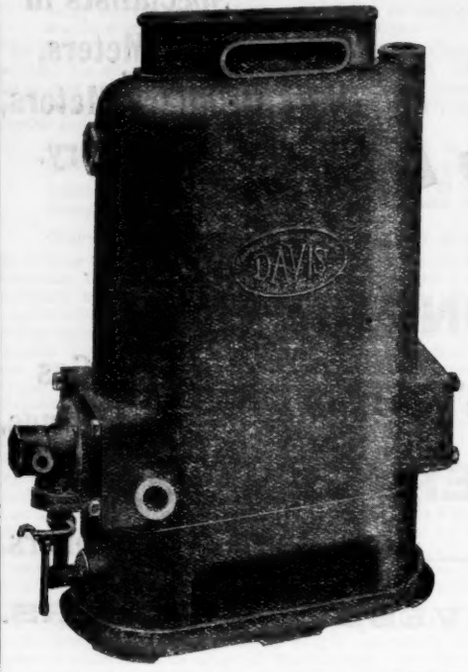

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GLASGOW GAS ENGINEERSHIP.

Appointment of Mr. M'Lusky.

The recommendation of the Glasgow Gas Committee which was recorded in last week's "Journal" [p. 73], that Mr. John W. M'Lusky be appointed General Manager and Engineer of the department, at a salary of £1500 a year, was included in minutes submitted to the Corporation at their last meeting by Bailie Drummond (the Convener of the Gas Committee).

Bailie Thomas Young having formally seconded the adoption of the minutes, it was proposed by Mr. Maclure, and seconded by Mr. Charles Scott, that Mr. George Keillor, of Greenock, be appointed at a salary of £1700 a year, rising to £2000. This was, however, subsequently withdrawn.

Another proposal was that the whole matter be remitted back to the Committee for further consideration. This was advanced by Mr. Rosslyn Mitchell, who said it was essential that they should obtain the finest expert in Great Britain; and the Selection Committee did not seem to be of opinion that they had such a man. Bailie Wheatley proposed that the matter be remitted back, with instructions to the Committee to confer with the gas workers regarding the appointment of a Manager. [Laughter.] This, he said, was a proposal that would test the sincerity of those who within the past six months or so had been declaring that the time had arrived when the worker should be raised from the subject status that he occupied to-day and placed in a more dignified position. If ever they were going to bring about this partnership, of which they were so fond of prating, surely this opportunity should be taken to give effect to their new-found principles.

Mr. Montgomery proposed that Mr. Samuel B. Langlands, Inspector of Lighting to the Glasgow Corporation, be appointed at a salary of £1200 a year, rising to £1500. He held that Mr. Langlands had ability, capacity, and experience at least equal to either of the two gentlemen already proposed.

On a first vote taken by roll call, 45 members voted for Mr. M'Lusky, 29 for Mr. Langlands, 10 for Mr. Rosslyn Mitchell's proposal, and 6 for that by Bailie Wheatley. The second vote was: Mr. M'Lusky 56; Mr. Langlands, 37.

Satisfactory Position at Liskeard.—The annual meeting of the Liskeard Gas Company was presided over by Mr. F. T. Depree, of Exeter, who submitted the report, which stated that the year had been most satisfactory, and in spite of many difficulties, the position of the Company was one of steady improvement. Mr. H. E. Riley (Consulting Engineer) reported that the quantity of gas manufactured had increased from 11,112,000 c.ft. to 11,949,000 c.ft., a rise of 7·5 p.ct.; and to produce this quantity 59 tons of coal less were used than in the previous year. Mr. W. H. Huddy (a Director) said he hoped they would very shortly be able to reduce the price of gas. A dividend of 6 p.ct. was declared.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

London, *Oct.* 20.

Pitch continues in good demand; makers' price being firm at well over 80s. per ton net f.o.b. makers' works. Creosote is steady at from 6d. to 6½d. per gallon net in bulk at works. Other values are as follows: Pure benzol and pure toluol, 2s. 9d. per gallon, net and naked. Pyridine, 4s. 6d. to 4s. 9d. per gallon. Anthracene, 48/50 p.ct., 9d. per unit, casks free. Solvent naphtha (95/160), 2s. 6d. per gallon, naked.

In sulphate of ammonia, the position remains unchanged. Supplies are taken up as they become available.

Tar Products in the Provinces.

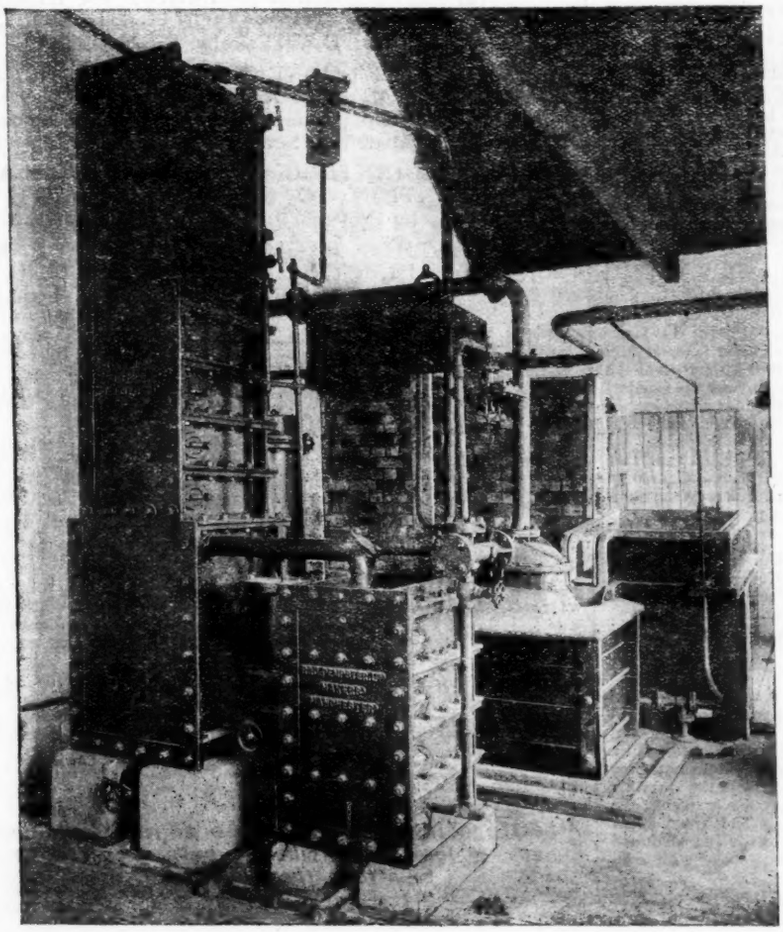
Oct. 20.

The average values for gas-works products during the week were: Gas-works coal tar, 37s. 6d. to 42s. 6d. Pitch, East Coast, 70s. to 72s. 6d. per ton f.a.s.; West Coast—Manchester, 60s. to 62s. 6d.; Liverpool, 60s. to 62s. 6d., Clyde, 70s. to 72s. 6d. nominal. Benzol 90 p.ct., North, 1s. 8d. to 1s. 10d.; crude 65 p.ct. at 120° C., 11½d. to 1s. 0½d. naked at makers' works; 50-90 p.ct. naked, North, 1s. 8d. to 1s. 10d. Toluol, naked, North, 2s. to 2s. 1d. nominal. Coal tar crude naphtha in bulk, North, 8d. to 8½d. Solvent naphtha, naked, North, 2s. 3d. to 2s. 4d. Heavy naphtha, North, 2s. 1d. to 2s. 3d. Creosote, in bulk, North, liquid, 5d. to 5½d.; salty, 4½d. to 4¾d. Heavy oils, in bulk, North, 6d. to 6½d. Carbolic acid, 60 p.ct., 1s. 6d. to 1s. 6½d. Naphthalene, £15 to £17 10s.; salts, £4 10s. to £6, bags included. Anthracene, "A" quality, 7½d. to 8d. per minimum 40 p.ct.; "B" quality nominal.

FROM A MARKET CORRESPONDENT.

Tar Products.

No definite change is to be noted in the condition of tar product markets since my last report; and prices are well maintained all round. Business has been much hindered and restricted by the difficulties and delays in moving goods, and shipping facilities are poor. Outputs in the North are far from normal. On the other hand, bye-product ovens are yielding good supplies in South Wales, where there is a very active demand for coke. Here, a few more ovens are now in operation; and it is expected that, with the commencement of next year, many more will be ready. Pitch remains strong, and in well-informed circles higher prices are looked for. The future is still a matter of uncertainty, as no one can say definitely whether or not the market is to be free from interference either here or on the Continent. Tars are being inquired for, and creosote remains in good request. There is a feeling that the last-named article will improve, owing to the expansion in the



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use of oil fuel. Naphthalenes are quiet. But among naphthas a very firm tone is maintained in solvent—supplies being insufficient to cover the present demand, particularly in the Provinces. Benzol is fully absorbed, and in some districts scarce. The demand is growing rapidly on the development of road transport. Production has fallen off, and there is good competition for crude; and so long as petrol supplies do not increase, there is no reason for prices to fall. There is no news of any importance in carbolic acid, and prices are nominal. Other products are without change.

The range of quotations is as follows:

Benzol: 90% London 2s. to 2s. 2d., North 1s. 11d. to 2s.; 50-90% 1s. 9d. to 2s. London, 1s. 10½d. North; crude, 60-65% 1s. 5d. to 1s. 7d.; pure, 3s. per gallon naked.

Carbolic Acid: Crude 60's 1s. 11d. per gallon nominal; crystals, 40%, 9d. per lb.

Crude Tar: London, 47s. to 50s.; Midlands, 44s. to 46s.; North, 44s. 6d. per ton *ex* works.

Pitch: London, 80s. to 85s. per ton; East Coast, 70s. to 75s. per ton; West Coast, 67s. 6d. to 72s. 6d., with Manchester 70s. per ton and Glasgow 72s. per ton; South Wales, 64s. to 68s. per ton.

Solvent Naphtha: London, 2s. 6d. Provinces average 2s. 5d. per gallon.

Crude Naphtha: Naked, 9d. per gallon.

Heavy Naphtha: 2s. 5d. per gallon.

Naphthalene: Refined, £16 to £18 per ton nominal; crude, £5 10s. to £11, according to quality.

Toluol: Naked, 2s. 6d. per gallon nominal. North, 2s. 5d.

Creosote: London, 7¼d.; North, 5¾d. to 6¼d.; heavy oil, 6d. per gallon in bulk.

Anthracene: 40-45%, 7d. to 7½d. per unit per cwt.

Grease Oils: 18° Tw. (naked), £6 10s. per ton f.o.r. makers' works.

Aniline Oil: 1s. 2d. per lb.

Cresylic Acid: 95%, 2s. 5d. to 2s. 6d.; 97-99%, 2s. 7d. to 2s. 8d. *ex* works London, f.o.b. other ports.

Sulphate of Ammonia.

Outputs have suffered slightly by reason of the strike, and deliveries have been delayed, with corresponding loss to the trade. Business shows a fair undertone, but is not particularly active. With prices fixed until May, an even course is all that can be looked for. The position regarding exports is difficult, and competition from other countries is being increasingly felt. For the first nine months of this year the exports from Great Britain are returned at 56,318 tons, as against only 12,370 tons in the corresponding nine months of last year, and 51,213 tons in the like period of 1917. It is somewhat satisfactory to find that the largest buyer this year has been Japan, with 18,410 tons, after which comes France, with 10,558 tons. Dutch East Indies comes third, with 7938 tons, followed by Spain and the Canary Islands, with 4820 tons. According to latest advices, American producers, who are selling largely to Spain and others of our pre-war customers, expect to figure larger and larger in these markets; but this remains to be seen. In the course of a paper read at the fifty-eighth annual convention of the American Chemical Society, it was shown that the tendency of ammonium sulphate to cake, even after drying and screening, was due to pyridine sulphate, and was overcome by treating the dry ammonium sulphate with ammonia gas, thus setting free the pyridine and permitting its removal.

Profiteering Committees and Gas-Fires.

The question of the charges made for gas-fires, &c., came before the Lambeth and Mitcham Profiteering Committees last week. The first named heard a complaint brought by the Lambeth Guardians against the Gas Light and Coke Company regarding an increase of approximately 50 p.ct. on the rental of gas-cookers, gas-fires, water heaters, &c. The Committee had received a letter from the Company in which they said that the hiring of gas-cookers did not come within the scope of the Act. They explained that the increased charges were due to the higher cost of renewals and repairs. The Committee agreed that the matter did not come within the scope of the Act, which only referred to sales and transactions, not to the hiring of articles; but they decided to ask for an opinion from the Central Tribunal. Before the Mitcham Tribunal a consumer alleged an overcharge on two gas-fires recently purchased from the Wandworth, Wimbledon, and Epsom Gas Company, for which he paid £6 17s. 10d. He had had these fires on hire for three years. In the course of the hearing, it transpired that the offer to purchase was made on Aug. 15, and that therefore it was impossible for the complainant to give the statutory four days' notice necessary under the Act from date of sale. But in spite of their legal position, the Company courted a full inquiry, without prejudice. It was proved that the existing cost of one fire was £6 11s. 4d., and that complainant was only charged £4 16s. 7d., being 26 p.ct. less than a new fire would cost. The Committee decided to dismiss the complaint, as they considered the Gas Company had no case to answer.

Purchase Question at Guisborough.—The Guisborough (Yorks) Gas Company have replied to the local Urban Council's inquiry regarding purchase of the undertaking, that they are not desirous of selling the works at present, but they are prepared to consider any substantial offer for the concern. The matter has been referred to a special meeting of the Lighting Committee.

Price of Gas at West Ham.—At a meeting of the West Ham Profiteering Committee a letter was read from a local resident, who said that the price of gas was a subject which the Committee could investigate with advantage to the public. The quality, the writer said, had been reduced, and the price had been increased. It appeared to him that gas companies had taken advantage of a grave national emergency to permanently reduce the quality of their gas; and the question should be taken up at once, and information obtained to justify the recent increase in price—if it could be justified. The Town Clerk pointed out that the matter was being dealt with by the Town Council at their next meeting; and the letter was referred to them for consideration.

THE

British Commercial Gas Association,

47, VICTORIA STREET, WESTMINSTER, S.W. 1.

EIGHTH

ANNUAL CONFERENCE

AT THE

Central Hall, Westminster.

ON

TUESDAY, 28th OCTOBER, 1919,

At 10.50 a.m.

WEDNESDAY, 29th OCTOBER, 1919,

At 10.30 a.m.

The President, The Rt. Hon. LORD MOULTON, P.C., K.C.B., F.R.S., in the Chair.

PROGRAMME.

TUESDAY, 28th OCTOBER, 1919.

10.50 a.m. Conference to assemble.

11.0 „ Welcome by the Mayor of the City of Westminster (Alderman G. W. Tallents).

11.10 „ Presidential Address by the Rt. Hon. Lord Moulton, P.C., K.C.B., F.R.S.

12.0 „ Address on COAL CONSERVATION by Sir Dugald Clerk, K.B.E., F.R.S., followed by discussion to be opened by Sir Arthur Duckham, K.C.B.

Appointment of Scrutineers.

1.15 p.m. ***Adjournment.***

3.0 „ PAPERS AND DISCUSSION on:—

(*a*) "THE SMOKE NUISANCE IN RELATION TO NATIONAL HEALTH," by Dr. C. W. Saleeby, F.R.S. (Edin.).

(*b*) "THE SMOKE NUISANCE—A PLEA FOR ACTION," by Dr. Harold A. Des Vœux (Hon. Treasurer of the Coal Smoke Abatement Society).

(*c*) "SCIENTIFIC HEATING IN RELATION TO NATIONAL HEALTH," by Professor Leonard Hill, M.B., F.R.S.

(*d*) "THE HYGIENE OF GAS AND ELECTRICITY FOR LIGHTING," by Samuel Rideal, Esq., D.Sc. (Lond.), F.I.C., &c.

WEDNESDAY, 29th OCTOBER, 1919.

10.30 a.m. Announcement of Result of Election of President for ensuing year.

PRESENTATION OF ANNUAL REPORT AND ACCOUNTS by the Chairman of the Executive (Mr. F. W. Goodenough), who will speak on The Future Work of the Association.

DISCUSSION.

11.15 „ PAPERS AND DISCUSSION ON "THE HOUSING PROBLEM":—

Practical Housing Schemes—

From an Architect's Standpoint, by H. Austen Hall, F.R.I.B.A.

From the Standpoint of the Supplier and Consumer of Gas, by H. H. Creasey.

1.0 p.m. Vote of Thanks.

A hearty invitation is extended to all representatives of gas undertakings (whether subscribers or not) to attend the Conference.

War Bonus at Brighouse.—The Brighouse Town Council have decided to grant war bonuses, as follows, to administrative, technical, and clerical staffs: To males aged 21 and upwards, £60 per year, *plus* the equivalent of 20 p.ct. of their present rate of remuneration, less £60 (the present war bonus); to females, the same terms, except that the sum of £60 is substituted by £40.

Brixham and Seaborne Coal.—To the Brixham Urban District Council last week, the General Purposes Committee reported that they had had under consideration the notice issued by the Brixham Gas Company to increase the price of gas to 7s. 1d. per 1000 c.ft. The local Fuel Overseer was instructed to call the attention of the Coal Controller to a circular issued by the Company, in which they state that the reason for having raised the price of gas was the insistence of the Coal Controller upon the Company taking seaborne coal. A protest was entered against such action, as increasing the cost of freightage, and it was pointed out that though the coal was landed at Dartmouth it had to be trucked to Brixham by rail, whereas it could equally well have been landed at Brixham, and thus have saved the cost of the rail journey.

Gas-Workers' Conditions at Wombwell.—The Barnsley district of the National Union of General Workers has applied to the Wombwell Urban District Council, on behalf of the gas-works employees, for a week's holiday with pay each year, and overtime rates at time-and-a-quarter for the first two hours and at time-and-a-half for all week-end work. The Gas Committee recommended that the week's holiday be granted, but that the question of the overtime rates be deferred.

Sheffield and Reduced Gas Quality.—The 15 p.ct. reduction ordered in the quality of the gas supplied at Sheffield does not appear to have affected the consumers seriously. Few complaints have reached the Gas Company; and there seems very little difference in the amount of light given by the street-lamps. People who use gas for cooking purposes, however, speak of the increased time operations are now taking. Besides being compelled to reduce the quality, gas companies may, also, if found necessary, reduce the pressure at certain periods of the day, in order that full pressure may be maintained at other times. The Sheffield Gas Company are not doing this, nor do they anticipate that they will have to. They are maintaining their full pressures throughout the day.

STOCK MARKET REPORT.

THE Stock Exchange has had another week of considerable activity, though business was not quite as feverish as the week before—and all the better for it. The tendency in general was good, especially in the higher-class markets; but in some lines movements were irregular. A cheering factor was presented in the good news from Russia, where the doom of the Bolshevik monster appears imminent.

The gilt-edged market had its full share of sunshine. Home Government issues, apart from bonds, were well supported, and on Friday Consols were marked at 52½ and War Loan at 95⅜; but Funding only touched 77¾, and Victory 84⅞. Indian and Colonial were in demand. Home Rails were quiet, closing firm. Canadians and Argentines were in good case.

In the Foreign Market, the feature was the advance of Russians, for reasons already noted. French were down on exchange, but recovered partially. Chinese and Japanese were firm. In Miscellaneous, Rubber was strong; but Oil was weaker. Among the rest, there was much oscillation.

Business in the Gas Market showed a considerable advance in the aggregate of bargains recorded, although comparatively few companies enjoyed notice at all. The lion's share fell to Imperial Continental, which had a brilliant week, and rose from an opening price of 128 to 139½; the quotation going up 10. Elsewhere the general tendency was rather downward; but there was a considerable advance in all three issues of Sheffield, without any transaction marked.

Bargains done for cash during the week were as follows: On Monday, Alliance and Dublin 47½, Bombay 5⅜, Continental Union 38, European 12, 12¼, Gas Light ordinary 59, 59½, 59¾, 60, ditto preference 66½, Imperial Continental 128, 128¼, 128½, 128⅝, 129, 133, Primitiva 30s., 31s. 3d., ditto preference 65s., 66s. 10½d., 67s. 6d., South Metropolitan 58, 58½, 60, ditto preference 95, Barnet District "A" 144. On Tuesday, Commercial 4 p.ct. 57, European 12⅜, 12½, 12⅝, Gas Light ordinary 59, 59¾, Imperial Continental 129, 131, 133, 133½, 134, 135, 136, 137½, Primitiva 30s., South Metropolitan 59, South Suburban debenture 85, Barnet District "B" 128. On Wednesday, Continental Union 38, Gas Light ordinary 59, 59¼, 59⅜, 59½, 59¾, 60, ditto preference 67, ditto debenture 53¼, Hong Kong 8½, Imperial Continental 135, 135½, 136, 136¾, 137½, Oriental 104½, South Metropolitan 59¼. On Thursday, Continental Union 38, European 12½, 12⅝, Gas Light ordinary 59, 59¼, 59¾, ditto maximum 46, Imperial Continental 135, 135½, 136, 137, 137½, 138½, 139½, Metropolitan of Melbourne 92½, 95⅝, Primitiva 30s., 32s. 9d., South Metropolitan 59¾, Barnet District "A" 139, ditto "C" 139, ditto "D" 100. On Friday, Bournemouth preference 9½, Brentford "B" 54½, Commercial 4 p.ct. 57½, Croydon "B" 104½, Gas Light ordinary 59, 59½, 59⅝, ditto maximum 47, ditto preference 65¼, 65½, Imperial Continental 136, 137½, 138, 138¼, Oriental 104½, 105, Primitiva 30s., 31s. 3d., ditto preference 63s. 9d., 65s., South Metropolitan 59, 59¼, 59½, 59⅝, Barnet "A" 144, ditto "B" 128.

In the Money Market there was no change from the easy condition which marked the previous week. The price of silver rose to 63⅜d. The Bank rate is 5 p.ct., as fixed on April 5, 1917.

The Lead Wool Company (1919), Ltd., has been registered, with a capital of £30,000 in £1 shares. The office is at Churchfields, Snodland, Kent.

ANTE-WAR PRICES AND DIVIDENDS, LATEST DIVIDENDS, AND LAST WEEK'S BARGAINS.

Issue. £	Shares	When ex-Dividend.	Ante-War Dividend & Bonus p.c.	Last Dividend.	NAME.	Closing Prices. July 30, 1914.	Present Prices.	Lowest and Highest Prices of Bargains.
189,049	Stk	July 31	4	4%	Aldershot 4 p.c. Pref.	..	60—65	..
1,551,868	,,	Sept. 26	2½	2⅝%	Alliance & Dublin Ord.	39—44	43—48	47½
874,000	,,	July 11	4	4%	Do. 4 p.c. Deb.	76—79	60—69	..
280,000	5	April 29	7½	8%	Bombay, Ltd.	5⅞—6⅛	5⅝—6⅛	5⅞
50,000	10	Aug. 28	15	12%		20—30	19—30	..
888,110	10	,,	7	7%	Bournemouth Gas { 10 p.c. B 7 p.c.	15—15½	10—11	..
115,000	10	,,	6	6%	and Water { Pref. 6 p.c. 4 p.c. Deb.	13½—14	9½—93	9⅝
159,740	—	June 27	—	4%		..	65—67	..
992,045	Stk.	July 11	14	37/-	Brentford A Consolid.	961—966	55—60	..
784,992	,,	,,	11	31/8	Do. B New	204—209	50—55	54¾
55,000	,,	,,	5	5%	Do. 5 p.c. Pref.	109—111	76—78	..
221,400	,,	June 11	4	4%	Do. 4 p.c. Deb.	91—93	64—66	..
214,775	,,	Sept. 11	11	7½%	Brighton & Hove Orig.	208—215	123—128	..
244,200	,,	,,	8	6¾%	Do. A Ord. Stk.	154—159	84—89	..
938,500	Stk.	—	5	5%	Bristol 5 p.c. max.	..	..	..
630,000	20	Sept. 26	12½	10%	British	44—45	24—26	..
190,000	Stk.	June 27	4	4%	Do. 4 p.c. Deb. Stk.	58—90	63—65	..
245,771	½	,,	4	4%	Buenos Aires 4 p.c. Deb.	85—87	50—53	..
100,000	10	—	—	—	CapeTown & Dist., Ltd.	1½—2½	0½—7	..
180,000	10	—	—	4½%	Do. 4½ p.c. Pref.	4—6	0½—7½	..
100,000	Stk.	June 27	4½	4½%	Do. 4½ p.c. Deb. Stk.	70—75	61—66	..
157,158	,,	Feb. 26	5	5%	Chester 5 p.c. Ord.	108—110	..	..
1,618,280	,,	Aug. 14	5/9/4	80/-	Commercial 4 p.c. Stk.	108—108	55—60	57—57½
980,000	,,	,,	5½	26/8	Do. 5½ p.c. do.	108—106	50—55	..
475,000	,,	June 11	8	8%	Do. 8 p.c. Deb. Stk.	69½—71½	50—53	..
300,000	,,	,,	4	—	Continental Union Ltd.	76—79	38—43	38
200,000	,,	,,	7	—	Do. 7 p.c. Pref.	115—118	65—70	..
51,600	Stk.	Aug. 28	14½	12%	Croydon A 10 p.c.	..	150—160	..
275,408	—	,,	11½	9⅝%	Croydon B and C 7 p.c..	..	100—110	104½
493,370	Stk.	,,	5	6¼%	Derby Con. Stk.	128—135	..	..
55,000	,,	—	4	4%	Do. Deb. Stk.	109—104	..	..
1,002,180	10	July 30	10	5/0	European, Ltd.	17½—18	12—13	12—12⅝
15,396,975	Stk.	,,	4/17/6	80/-		98—102	58—61	59—60
2,600,000	,,	,,	3½	26/8	Gas Light and Coke { 4 p.c. Ord. 3½ p.c. max.	76—79	46—48	46—47
4,969,398	,,	,,	4	4%	4 p.c. Con. Pref.	96—99	65—68	65½—67
4,674,850	,,	June 11	8	8%	3 p.c. Con. Deb.	72½—74½	52—55	..
180,000	,,	,,	10	10%	10 p.c. Bonds	..	..	..
89,500	,,	Sept. 11	5	4½%	Hastings & St. L. 5 p.c.	..	57—62	..
358,740	,,	,,	8½	9⅜%	Do. 8½ p.c	37—39	42—47	..
70,000	10	April 29	11	7%	Hongkong & China, Ltd.	16½—16¾	7⅞—8⅛	8½
98,500	Stk.	Aug. 28	9	8½%	Hornsey 7 p.c..	..	110—115	..
131,900	,,	Sept. 11	7½	5¾%	Ilford A and C.	151—154	88—93	..
65,780	,,	,,	6¾	4½%	Do. B	115—118	67—72	..
66,500	,,	June 27	4	4%	Do. 4 p.c. Deb.	92—94	61—64	..
4,940,000	,,	May 14	9	4½%	Imperial Continental	150—150	135—140	128—139½
1,295,000	,,	Aug. 14	8½	8½%	Do. 8½ p.c. Deb. Red.	84—86	79—83	..
235,242	,,	Sept. 11	6¾	6¾%	Lea Bridge Ord. 5 p.c.	119—121	87—92	..
3,498,986	,,	Feb. 26	10	42/6	Liverpool 5 p.c. Ord. { A B	211—213 145—148	..	..
806,088	,,	June 26	4	4%	Do. 4 p.c. Pr. Deb. Stk.	..	..	..
155,736	,,	Aug. 14	7/5/6	8⅜%	Maidstone 5 p.c.	..	56—61	..
75,000	5	June 11	6	8%	Malta & Mediterranean Met. of Melbourne { 4½ p.c. Deb.	4½—4⅝	2—3	..
150,000	100	Oct. 1	4½	4½%		99—101	90—97	92½—95⅝
541,920	20	May 29	4	5%	Monte Video, Ltd.	11½—12	12½—13½	..
1,875,892	Stk.	July 30	4½	3¾%	Newcastle&Gatsh'd Con.	98½—99½	64—65	..
539,706	,,	June 27	3½	3½%	Do. 3½ p.c. Deb.	83—88	57—58	..
15,000	10	Sept. 11	—	11%	North Middlesex 10 p.c.	..	13½—13⅝	..
55,940	10	,,	7/14/0	7%	,, ,, 7 p.c.	14—15	9—9½	..
800,000	Stk.	May 14	8	8%	Oriental, Ltd.	117—129	103—106	104½—105
60,000	5	Mar. 26	10	1/-	Ottoman, Ltd.	7½—7¾	4⅝—5½	..
60,000	50	Aug. 28	15	7½%	Poriseu, Island B	128—131	74—76	..
100,000	50	,,	12	6¼%	Do. C	118—121	66—68	..
249,980	5	April 29	8	—	Primitiva Ord.	5½—6	1½—2	30/—32/9
499,960	5	June 26	5	—	Do. 5 p.c. Pref.	4⅝—5	3⅛—3⅜	63/9—67/6
521,600	100	June 2	4	4%	Do. 4 p.c. Deb.	91—98	71—73	..
600,000	Stk.	July 30	4	4%	Do. ,, ,, 1911	..	49—52	..
846,198	,,	June 27	4	4%	River Plate 4 p.c. Deb.	85—87	49—52	..
150,000	10	Sept. 26	6	6/-	San Paulo { 6 p.c. Pref. 5 p.c. Deb.	10½—11	7½—8	..
195,000	50	July 2	5	5%		47—49	40—42	..
185,000	Stk.	Aug. 28	10	5%	Sheffield A	228—234	87—92	..
209,984	,,	,,	10	5%	Do. B	223—234	87—92	..
528,500	,,	,,	10	4¾%	Do. C	230—233	80—85	..
188,201	Stk.	Sept. 12	4	4%	Shrewsbury 5 p.c.	..	..	..
90,000	10	Oct. 15	9	10%	South African.	10½—11½	12—13*	..
5,609,895	Stk.	Aug. 14	5/4/0	80/-	South Met. 4 p.c. Ord.	111—113	58—61	58—59½
250,000	,,	July 11	—	5%	Do. Pref.	..	94—96	95
1,895,445	,,	,,	3	3%	Do. 3 p.c. Deb.	72½—74½	51—54	..
224,890	,,	Aug. 14	5½	5%	South Shields Con. Stk.	157—159	104—106	..
953,795	,,	,,	6	3⅞%	S'th Suburb'n Ord. 5 p.c.	114—116	68—73	..
187,558	Stk.	June 27	5	5%	Do. 5 p.c. Deb. Stk.	116—118	85—88	85
647,740	,,	May 14	7½	3%	Southampton Ord.	99—102	68—68	..
121,975	,,	June 27	4	4%	Do. 4 p.c. Deb. Stk.	..	63—65	..
190,000	,,	Aug. 14		4½%	Tottenham { A 5 p.c.	135—138	70—75	..
789,975	,,	,,	6	3%	District { B 3½ p.c.	115—117	50—55	..
181,255	,,	June 26	4	4%	4 p.c. Deb.	87—89	54—66	..
189,880	10	Dec. 30	5	—	Tuscan, Ltd.	5—6	1—2	..
149,900	10	July 1	5	5%	Do. 5 p.c. Deb. Red.	93—95	45—50	..
236,476	Stk.	Sept. 26	5	5%	Tynemouth 5 p.c. max..	102½—109	80½—82½	..
80,000	,,	Aug. 28	8⅜	55/-	Wandsworth, Wimbledon, and Epsom— Wandsworth A 5 p.c..	151—156	85—90	..
255,686	,,	,,	6¾	40/-	Do. B 3½ p.c.	129—134	63—68	..
108,075	,,	,,	—	38/6	Do: C	..	63—68	..
140,865	,,	—	—	38/6	New Ordinary	..	63—68	..
259,000	,,	,,	6½	38/9	Wimbledon 5 p.c.	117—122	65—70	..
98,000	,,	,,	6¾	40/-	Epsom 5 p.c.	121—126	65—70	..
88,416	,,	June 27	3	3%	3 p.c. Deb. Stk.	56—59	49—51	..

* Ex Div.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official List" for Oct. 15.]

Nos. 24,292—24,949.

ADAMS, P. E.—"Matchless gas-lighter." No. 24,674.
ARCHDALE, J. A.—"Mouthpieces for vertical gas-retorts, &c." No. 24,316.
ARCHDALE, J. A.—"Machine for charging vertical gas-retorts, &c." No. 24,317.
ARCHDALE, J. A.—"Valve and inspection device for off-take pipes of gas-retorts, &c." No. 24,318.
BESSEMER GAS-ENGINE COMPANY.—"Hot-plate apparatus, and heating thereof." No. 24,828.
BLAKEY, J. W.—"Gas and air burners." No. 24 447.
CAMP, E.—"Bunsen, &c., burners." No. 24,500.
CARNELL, P.—"Holders for cleaning needles for vapour, &c., burners." No. 24,461.
CARTLIDGE, A. E.—"Device for stopping leaks in pipes." No. 24,469.
COLLINS, H. T.—"Taps for controlling supply of fluids." No. 24,424.
DAVIES, H. L.—"Upright incandescent gas-burners, &c." No. 24,900.
ESPUJOLS, R. L. D'.—"Burners." No. 24,412.
GOODALL, CLAYTON, & Co.—See Archdale. Nos. 24,316, 24,317, 24,318.
HANKE, W.—"Globes, chimneys, &c., for gas burners, lamps, &c." No. 24,901.
HANSEN, E. HOLM.—"Lighting arrangement for gas-burners, &c." No. 24,638.
HEATH & SONS.—See Carnell. No. 24,461.
LARKIN, F. S.—"Hot-plates of gas-stoves, &c." No. 24,296.
LINDSAY LIGHT COMPANY.—"Manufacture of thorium compounds." No. 24 925.
LUTTINGER, W. G.—"Burner for stoves." No. 24,581.
MURFITT, J. M.—"Apparatus for production of carburetted air for lighting and power." No. 24,493.
PARRISH, P.—"Manufacture of sulphuric acid." No. 24,386.
PAYNE, C. R.—See Archdale. Nos. 24,316, 24,317.
PRIEST, G. F.—"Continuous regenerative gas-fired kilns." No. 24,383.
ROOK, E. & H. E.—"Saturated gas-plant." No. 24,449.
SCOTT, H. A.—"Gas or fluid fuel cooking-ovens." No. 24,304.
SOUTH METROPOLITAN GAS COMPANY.—See Parrish. No. 24,386.
TONKIN, E. C.—"Taps for controlling supply of fluids." No. 24,424.
WADE, H.—See Lindsay Light Company. No. 24,925.
WHITE, A. E.—See Bessemer Gas-Engine Company. No. 24,828.

Motor Spirit Maximum Prices Order Revoked.—The Board of Trade announced that the "Profiteering Act, 1919, Maximum Prices Order, No. 2," which fixed maximum prices for the sale of motor spirit, has been revoked.

New Mills and the Maximum Price.—At a meeting of the New Mills (Derbyshire) District Council on Wednesday last, it was reported that authority had been received from the Board of Trade to increase their maximum charge for gas to 6s. per 1000 c.ft.; and the Council decided to advance the price to consumers forthwith to 5s. This is about double the pre-war charge. The Council also supply gas to Disley; and the price to consumers there will be 5s. 9d. per 1000 c.ft.

Gas Consumption at Cirencester.—The consumption of gas at Cirencester during the year ended June 30 was 44½ million c.ft., or practically the same as the previous year. The cost of coal increased by over £2000 for the year; while wages rose from £985 to £1521. Thus the profit of the Cirencester Gas Company, Ltd., has been reduced; and the Directors have been compelled to raise the price of gas to 6s. per 1000 c.ft. The dividend for the year on the several classes of shares is 8, 4, and £5 12s. p.ct.

Gas-Meter Rents at Kidderminster.—Protests in vigorous terms have been entered by members of the Kidderminster Town Council against the action of the Gas Company in increasing the charge for the hire of gas-meters. Though it was pointed out that the Company were fully protected by their Act of Parliament, the Town Clerk was directed to report all the facts to the Profiteering Committee. The Co-Operative Society also passed a resolution of protest against the Company's action; and the President gave an assurance that further steps would be taken in the matter.

Price of Gas at Bradford.—In explaining the cause of the advance of 10d. per 1000 c.ft. in the price of gas at Bradford, Mr. J. H. Barraclough (the Chairman of the Gas Committee) told the City Council that at the existing price of 4s. there would be a loss in the coming year of not less than £56,000. Estimating for no further advances, there would be an extra of £62,000 in coal alone. The 10d. advance would yield £68,000; and the present deficit was £88,000. The introduction of vertical retorts had resulted in a decrease of £2320 in carbonizing wages; whereas there would otherwise have been an increase of £54,000.

Trouble from Deposits of Naphthalene.—A letter in the "Times" complaining of trouble with the gas supply, led to a reply by Mr. W. L. Galbraith, the Secretary of the Gas Light and Coke Company, in which he said the trouble from which the correspondent was suffering was obviously not caused by the rather lower quality gas which, by order of the Government, the Company have been supplying since the railway strike. It must be due to some local stoppage, probably caused by deposits in the pipes of naphthalene, of which the Company have unfortunately a temporary epidemic. The gas which they are supplying gives excellent results in properly adjusted appliances provided there is no stoppage in the service-pipes to restrict the flow of gas.

Mr. Charles Burdis, who has represented the Richmond Gas Stove and Meter Company, Ltd., in South and South-West England for very many years, had recently to undergo a somewhat severe operation. His many friends will be glad to know that he is making a normal recovery; and it is hoped that in the course of a few weeks he will be able to resume business.

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